Thompson Creek
Flood Protection Project

San Jose, CA

LOMR Application
April 2000

Santa Clara Valley Water District
(408) 265-2600

TC425T46T4200 c.1

SANTA CLARA VALLEY WATER DISTRICT
LIBRARY
5750 ALMADEN EXPRESSWAY
SAN JOSE, CALIFORNIA 95118

Correspondence

March 20, 2001

Ms. Sheila Norlin, Regional Manager
Federal Emergency Management Agency, Region 9
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304

Dear Ms. Norlin:

Subject: Thompson Creek Flood Control Project—Letter of Map Revision Application

This letter responds to your June 30, 2000, request for additional information on our application for a Letter of Map Revision (LOMR) for the Thompson Creek flood protection project in the city of San Jose, California. The enclosed information presents further documentation that the work on Thompson Creek from Quimby Road to Westgrove Lane complies with the Federal Emergency Management Agency (FEMA) requirements outlined in the June 30 letter.

1a. Boundary delineations of the effective and proposed Special Flood Hazard Area (SFHA), the area that would be inundated by the flood having a 1 percent chance of being equaled or exceeded in any given year (base flood).

We are requesting a reduction in the SFHA based on the improvements which have been completed. All flows are contained within the channel. We have annotated an enclosed copy of the existing Flood Insurance Rate Map to show what AO zone is to be removed. There are no other map changes requested.

1b. Topographic contour information used for the base floodplain boundary delineations.

The floodplain boundary is contained within the channel and levee improvements shown on enclosed plans dated 1980 and 1991.

1c. Locations and alignments of cross sections 30262, 30947, 31447, 6085, 6607, 6885, and 7041.

The stations correspond to the cross sections and alignments on the previous FEMA study. Stations 30262, 30947, and 31447 are on Silver Creek below the confluence with Thompson Creek. Stations 6085, 6607, 6885, and 7041 are in Thompson Creek upstream of the completed flood protective works and are also part of the previous FEMA study. They are unaffected by the LOMR request. See the enclosed 1986 Flood Insurance Study profile which has been annotated to indicate the limits of the Thompson Creek improvements.

1d. All other applicable items listed on page 1 of Application/Certification Form 5, entitled "Riverine/Coastal Mapping Form."

The LOMR request is to remove a small AO zone based on the flood protection improvements which have been constructed. The form has been completed and a copy of the improvement plans are enclosed.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE/COASTAL MAPPING**	O.M.B No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: City of San Jose, California

Flooding Source: Thompson Creek

Project Name/Identifier: Case No. 00-09-597P

This is a ☒ Manual ☐ Digital submission. *Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance as possible.*

1. MAPPING CHANGES

1. A topographic workmap must be submitted showing the following information (check N/A when not applicable):

a. Revised approximate 100-year floodplain boundaries (Zone A)	☐ Yes	☐ No	☐ N/A
b. Revised detailed 100- and 500-year floodplain boundaries.	☒ Yes	☐ No	☐ N/A
c. Revised floodway boundaries	☐ Yes	☐ No	☒ N/A
d. Location and alignment of all cross sections with stationing control indicated.	☒ Yes	☐ No	☐ N/A
e. Stream alignments, road alignments and dam alignments.	☐ Yes	☐ No	☒ N/A
f. Current community boundaries.	☐ Yes	☐ No	☒ N/A
g. Effective 100-year floodplain and floodway boundaries from FIRM/FBFM reduced or enlarged to the scale of the topographic workmap	☐ Yes	☐ No	☒ N/A
h. Tie-ins between the effective and revised 100-, 500-year and floodway boundaries	☐ Yes	☐ No	☒ N/A
i. The requester's property boundaries and community easements	☐ Yes	☐ No	☒ N/A
j. The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
k. Location and description of reference marks	☒ Yes	☐ No	☐ N/A
l. Vertical datum (example: NGVD, NAVD)	☒ Yes	☐ No	☐ N/A
m. Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
n. Location and alignment of all coastal transects used to revise the coastal analyze	☐ Yes	☐ No	☒ N/A
o. V-zone has been delineated to extend landward to the heel of the primary frontal dune	☐ Yes	☐ No	☒ N/A

If any items are marked No or N/A please attach an explanation.

2. What is the source and date of the updated topographic information (example: orthophoto maps, July 1985; filed survey, May 1979, beach profile, June 1987 etc.)?

5/14/1993 Enclosed blueline copies

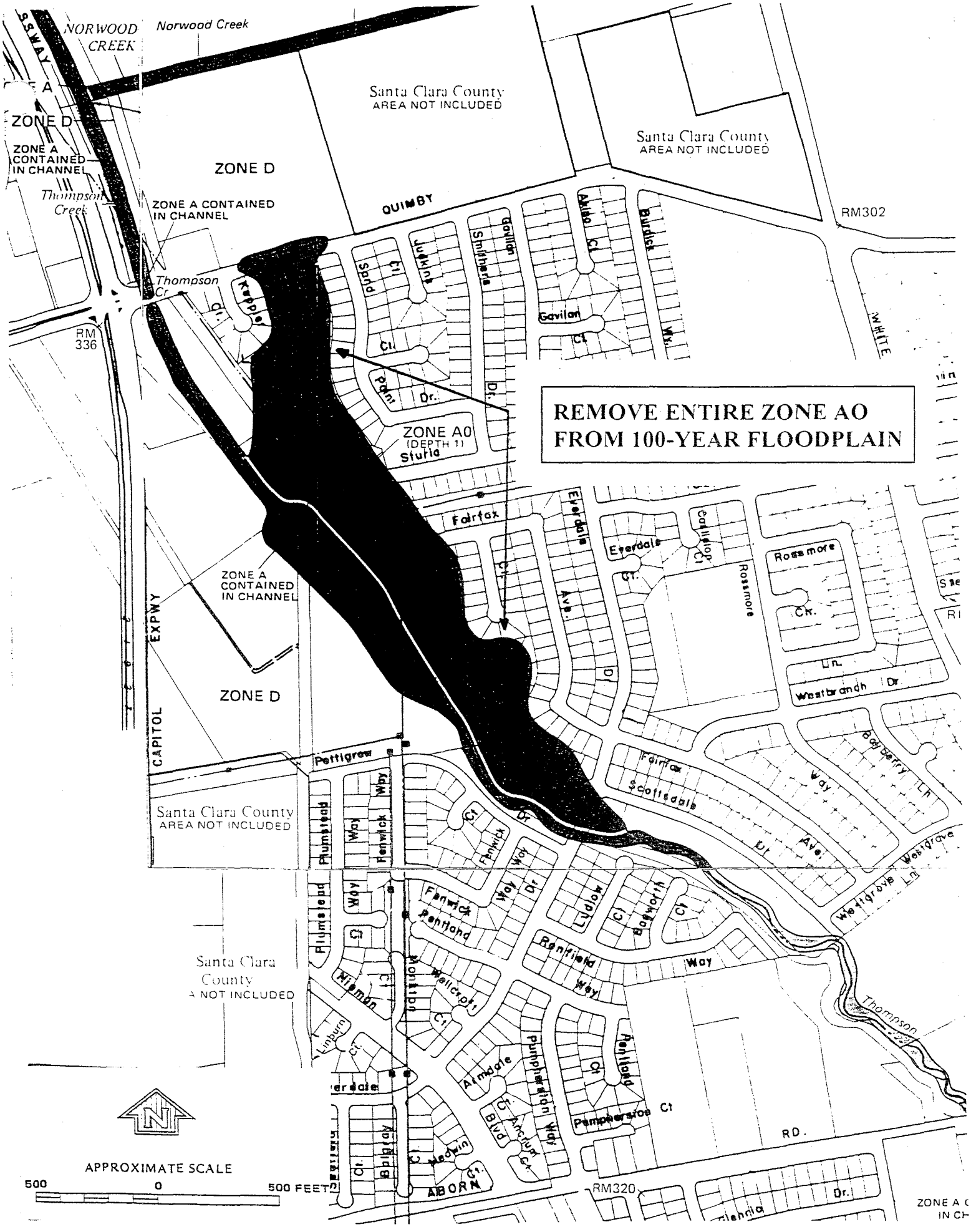
3. What is the scale and contour interval of the following workmaps?

Effective FIS	Scale _____	Contour Interval _____
Revision Request	Scale 1" = 200'	Contour Interval 2 ft

NOTE: Revised topographic information must be of equal or greater detail than effective.

4. Attach an annotated FIRM/FBFM at the scale of the effective FIRM/FBFM showing the revised 100- and 500-year floodplain and the floodway boundaries and how they tie into those shown on the effective FIRM/FBFM downstream and upstream of the revisions or adjacent to the area of revision for coastal studies. **FIRM/FBFM attached?** ☒ **Yes** ☐ **No**

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS


NORWOOD CREEK
Norwood Creek
S.S.WAY
ZONE D
ZONE A CONTAINED IN CHANNEL
Thompson Creek
Santa Clara County
AREA NOT INCLUDED
Santa Clara County
AREA NOT INCLUDED
ZONE D
ZONE A CONTAINED IN CHANNEL
QUIMBY
RM302
Thompson Cr
RM 336
WHITE
REMOVE ENTIRE ZONE AO
FROM 100-YEAR FLOODPLAIN
ZONE AO
(DEPTH 1)
Fairfax
ZONE A CONTAINED IN CHANNEL
CAPITOL EXPWY
ZONE D
Pettigrew
Santa Clara County
AREA NOT INCLUDED
Santa Clara County
A NOT INCLUDED
Thompson
RM320
APPROXIMATE SCALE
500 0 500 FEET

NOLTE
BEYOND ENGINEERING

MEMORANDUM

TO:	**Randy Talley, SCVWD**	**DATE:**	**March 7, 2001**
FROM:	**George B. Otte**	**PROJ #:**	**SJ0758**
SUBJECT:	**Thompson Creek Interior Drainage Analysis for LOMR**		

PURPOSE

This memorandum addresses the technical evaluation necessary to answer questions 1-6 of Section 10 - Interior Drainage of Form 8 - Levee/Floodwall System Analysis. This evaluation was performed for the section of Thompson Creek between Quimby Road and Westgrove Lane, where levees have been constructed, to determine if any significant ponding takes place that would obstruct the public right-of-way.

PROCESS

A detailed review of the existing topography was conducted based on topographic mapping with 4 ft contour intervals and spot elevations. The review identified the overland release paths that convey water to the channel or to the levee and along the levee until the flow can enter the channel.

The storm drain system drawings and the project construction drawings were also reviewed to determine if the inlets of the storm drains outside of the channel are below the calculated 100-yr water surface elevation in the channel. These systems were further reviewed for the presence of backflow prevention devices such as flap gates. The capacity for any pipe entering the channel to backflow water from the channel into adjacent areas was calculated as well as the ability of the existing terrain to release the backflow once it begins.

OBSERVATIONS

The area northeast of Thompson Creek, bounded by Quimby Road, White Road, Westgrove Lane, and Thompson Creek, drains northwesterly by both surface flow and piped storm drain flow. The surface flow in this vicinity drains toward the Creek and then along the levee and adjacent roads. The area releases freely in the northwest direction, eventually crossing Quimby Road and/or the Quimby Road/Capital Expressway intersection returning to the creek downstream of the levee section without significant ponding. The street capacity immediately upstream of Quimby Road on Scottsdale Road was checked for conveyance capacity since this street appears to carry flow from the largest tributary area. The calculated flow at Scottsdale

Road at the intersection of Quimby Road is 59cfs. The depth of flow in the street at this location will be approximately 0.55 feet during the 100-yr event. This calculation verifies that the street will carry flow away from the area without causing flooding of private property.

The area southwest of Thompson Creek, bounded by Thompson Creek, Aborn Road, and Capital Expressway, drains northwesterly by both surface flow and piped storm drain flow as well. Surface flow in this area drains west, away from Thompson Creek to Capital Expressway, then either drains north along the expressway or travels west across Capital Expressway without significant ponding.

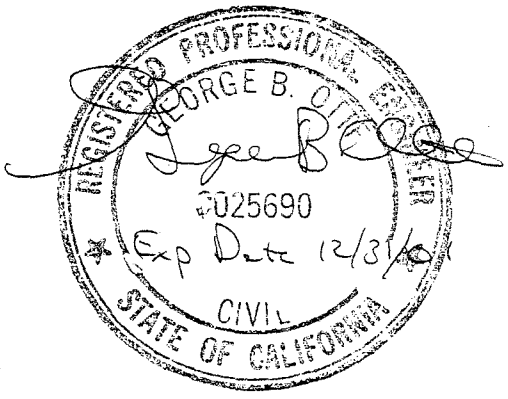
Nine of the ten outfall structures located on Thompson Creek between Westgrove Lane and Quimby Road will release toward the channel during the 100-yr event. The exception is the Pettigrew Court outfall structure, located on the southwest side of the creek. The Pettigrew Court outfall can release a maximum of 17cfs of flow out of the channel when the manhole cover adjacent to the creek is completely lifted off and the channel is at the calculated 100-yr water surface elevation. The backflow produced from the Pettigrew Court outfall structure will release overland away from the creek along Pettigrew Drive. Pettigrew Drive has 61 cfs of flow capacity which is adequate to carry away the backflow from this outfall..

CONCLUSION

The drainage area flowing toward Thompson Creek between Quimby Road and Westgrove Lane (approximately 335 acres) does not have any significant ponding during the 100-year event.

This analysis has been performed under the direction of:

George B. Otte, PE,
Registration: California, C025690
Expiration Date: 12/31/01



SUBJECT: Thompson Creek Interior Drainage Analysis for LOMR

JOB NO. SJ0758

DESIGNED BY

DATE 3-7-01

CHECKED BY

NOLTE

Overland Runoff to Scottsdale Dr. @ Quimby Rd.

Rational Method

$Q = CIA$

C-value: Weighted C → 20% of Area is Paved Street w/ C-value of 0.9

80% of Area has C-value of 0.6

$(0.20)(0.9) = 0.18$

$(0.80)(0.6) = 0.48$

$0.66 = C$

I, from Santa Clara County Drainage Manual

– T_c from Figure 3: $K = L^{3/2}/H^{1/2} = \frac{(5900)^{1.5}}{(47)^{1/2}} = 66,104$,

Therefore T_c = 38 minutes

Add 10 min for flow off of Rooftops → 38+10 = 48 minutes

∴ – I from Figure 6, Duration = 48 min

For 100yr event, I = 0.9 inches/hr

A = 100.31 acres → Contributing to Scottsdale @ Quimby Rd

$Q = CIA \rightarrow (0.66)(0.9\ in/hr)(100.31\ Acres) = 59\ cfs$

Thompson Creek Interior Drainage Analysis for LOMR

SUBJECT

SJ0758

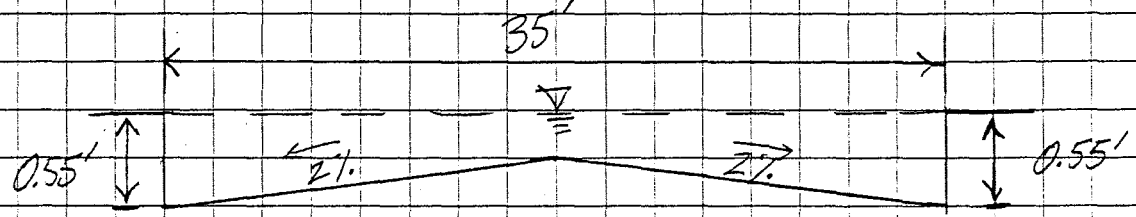
OB NO. DESIGNED BY

3-7-01

DATE CHECKED BY

NOLTE

Street Capacity for Scottsdale Dr. @ Quimby Rd.



Assumptions:
- Crown of street graded @ 2%
- Street Width is 35'
- Water Depth is 0.55'

$A = 13.1\ ft^2$

$P = 36.1\ ft$

$n = 0.013$

$S = 0.006$

Mannings Formula:

$$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$$

$$Q = \frac{1.49}{0.013} (13.1)\left(\frac{13.1}{36.1}\right)^{2/3} (0.006)^{1/2}$$

$Q = 59\ cfs$ ✓ OK

Thompson Creek Interior Drainage Analysis for LOMR

SUBJECT

SJ0758

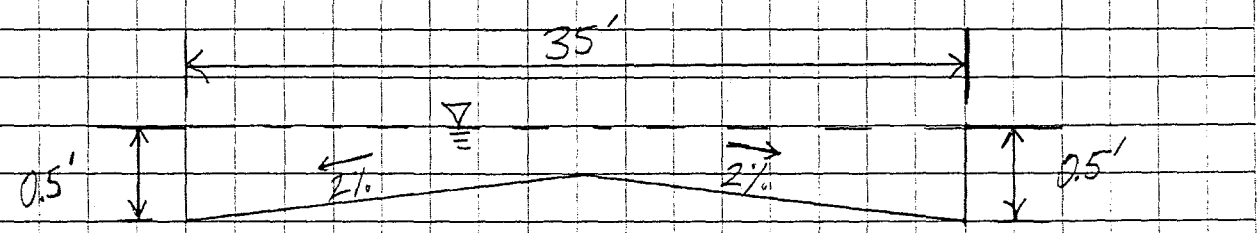
OB NO. DESIGNED BY

3-7-01

DATE CHECKED BY

NOLTE

Street Capacity for Pettigrew Dr. releasing Northwesterly from Pettigrew Ct.



Assumptions: - Crown of street graded @ 2%
- Curb height & water depth is 0.5'
- Street width is 35'

$A = 11.4\ ft^2$

$P = 36.0\ ft$

$n = 0.013$

$S = 0.01$

Mannings formula:

$$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$$

$$Q = \frac{1.49}{0.013}(11.4)\left(\frac{11.4}{36.0}\right)^{2/3}(0.01)^{1/2}$$

$$Q = 61\ cfs$$

9. SETTLEMENT

1. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No
2. The computed range of settlement is _____ ft. to _____ ft.
3. Settlement of the levee crest is determined to be primarily from:

   ☐ Foundation consolidation
   ☐ Embankment compression
   ☐ Other (describe):

4. Differential settlement of floodwalls

   ☐ has ☐ has not been accommodated in the structural design and construction.

Note: Attach engineering analysis to support construction plans.

10. INTERIOR DRAINAGE

1. Specify size of each interior watershed

   Draining to pressure conduit: N/A-All areas adjacent to the levee along Thompson Creek release without ponding.

   Draining to ponding area: N/A

2. Relationships Established

Ponding elevation vs. storage	☐ Yes	☒ No
Ponding elevation vs. gravity flow	☐ Yes	☒ No
Differential head vs. gravity flow	☐ Yes	☒ No

3. The river flow duration curve is enclosed ☐ Yes ☒ No
4. Specify the discharge capacity of the head pressure conduit: N/A
5. Which Flooding Conditions Were Analyzed?

• Gravity flow (Interior Watershed)	☒ Yes	☐ No
• Common storm (River Watershed)	☒ Yes	☐ No
• Historical ponding probability	☒ Yes	☐ No
• Coastal wave overtopping	☐ Yes	☒ No

   If No, explain why not: Thompson Creek is not located near coastal area.

6. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☒ Yes ☐ No

   If No, explain why not:

7. The rate of seepage through the levee system for the 100-year (base) flood is _____ cfs

REGISTERED PROFESSIONAL ENGINEER GEORGE B. O... 025690 Exp Date 12/31/0... CIVIL STATE OF CALIFORNIA

FLOOD INSURANCE STUDY



CITY OF SAN JOSE, CALIFORNIA
SANTA CLARA COUNTY

VOLUME 2 OF 2



REVISED: FEBRUARY 19, 1986

Federal Emergency Management Agency

COMMUNITY NUMBER-060349

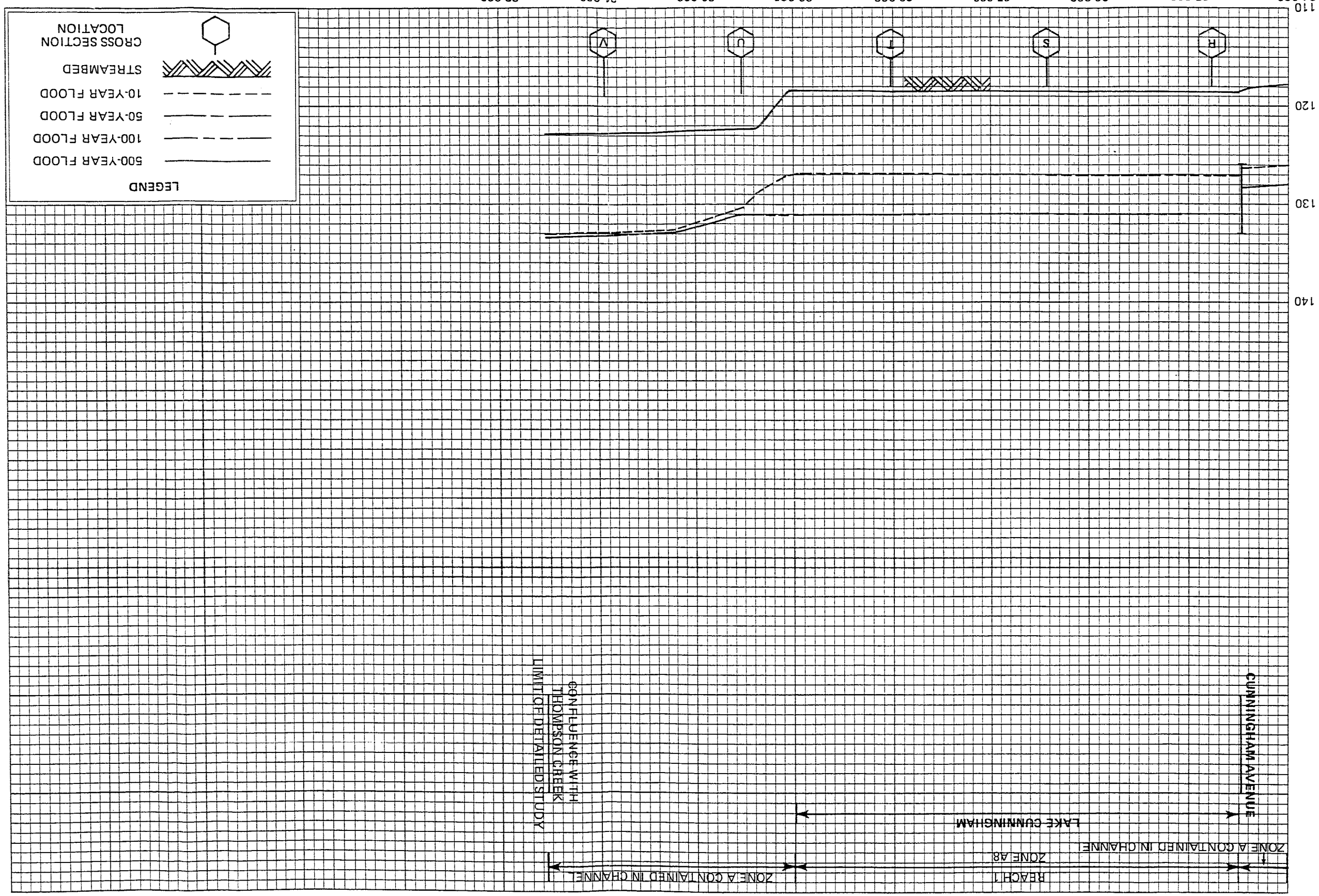
FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF SAN JOSE, CA

(SANTA CLARA CO.)

FLOOD PROFILES

SILVER CREEK



ZONE A CONTAINED IN CHANNEL

Thompson Creek Project

CONFLUENCE WITH SILVER CREEK AND NORWOOD CREEK

QUIMBY ROAD

Westgrove Lane

ELEVATION (FEET NGVD)

200
190
180
170
160
150
140
130
120

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 6500

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH SILVER CREEK AND NORWOOD CREEK

A B C D E

LEGEND

- 500-YEAR FLOOD
- 100-YEAR FLOOD
- 50-YEAR FLOOD
- 10-YEAR FLOOD
- STREAMBED
- CROSS SECTION LOCATION

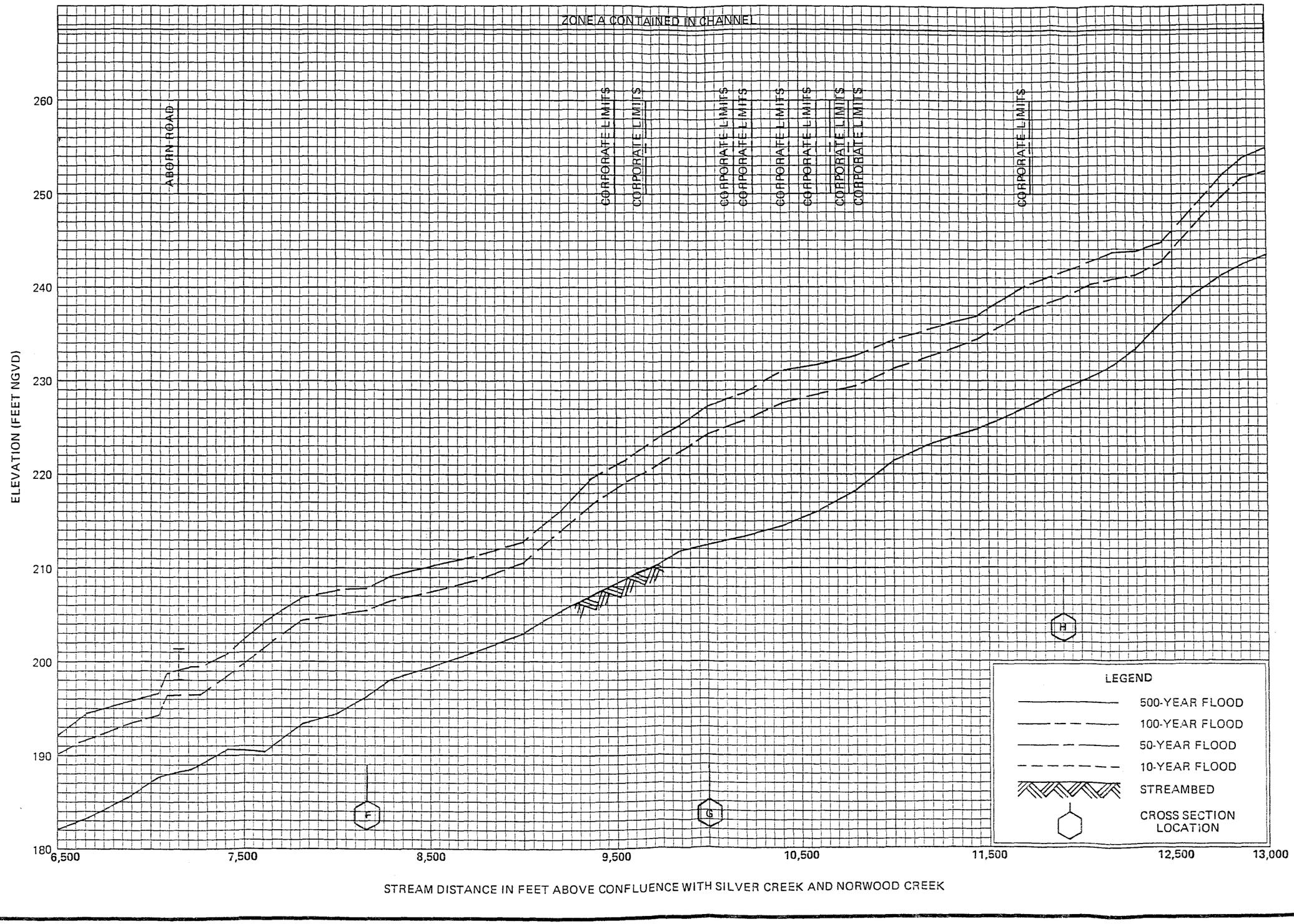
FLOOD PROFILES

THOMPSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF SAN JOSE, CA
(SANTA CLARA CO.)

44P



FLOOD PROFILES

THOMPSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CITY OF SAN JOSE, CA
(SANTA CLARA CO.)

45P

LOMR APPROVED

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 00-09-597P

The Honorable Ron Gonzalez
Mayor, City of San Jose
801 North First Street, Room 600
San Jose, CA 95110

Community: City of San Jose, CA
Community No.: 060349
Panel Affected: 0027 D and 0033 E
Effective Date of This Revision: JUN 05 2001

102-I-C

Dear Mayor Gonzalez:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for your community in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated March 30, 2000, Mr. Randall R. Talley, P.E., Engineering Unit Manager, Flood Management Policy Planning Unit, Santa Clara Valley Water District, requested that FEMA revise the FIRM to show the effects of levee improvements and construction of a floodwall along Thompson Creek from Quimby Road to approximately 1,000 feet downstream of Aborn Road.

All data required to complete our review of this request were submitted with letters from Ms. Sara Duckler, P.E., Assistant Civil Engineer, Flood Projects Unit, Santa Clara Valley Water District, and Mr. Talley.

We have completed our review of the submitted data and the flood data shown on the effective FIRM and in the effective Flood Insurance Study (FIS) report. We have revised the FIRM to modify the floodplain boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Thompson Creek from Quimby Road to approximately 1,000 feet downstream of Aborn Road. As a result of the modifications, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Thompson Creek increased in some areas and decreased in other areas. The base flood is contained within the channel from Quimby Road to approximately 1,000 feet downstream of Aborn Road, and the right overbank area (looking downstream) was removed from the SFHA. The modifications are shown on the enclosed annotated copies of FIRM Panels 0027 D and 0033 E. This Letter of Map Revision (LOMR) hereby revises the above-referenced panels of the effective FIRM dated August 2, 1982.

The modifications are effective as of the date shown above. The map panels as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panels and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare a related article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed minimum NFIP criteria. These criteria are the minimum and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications made by this LOMR. Our records show that your community has met this requirement.

A Consultation Coordination Officer (CCO) has been designated to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Jack Eldridge
Chief, Community Mitigation Programs Branch
Federal Emergency Management Agency, Region IX
The Presidio of San Francisco, Building 105
San Francisco, CA 94129-1250
(415) 923-7184

FEMA makes flood insurance available in participating communities; in addition, we encourage communities to develop their own loss reduction and prevention programs. Through the *Project Impact: Building Disaster Resistant Communities* initiative, launched by FEMA in 1997, we seek to focus the energy of businesses, citizens, and communities in the United States on the importance of

reducing their susceptibility to the impact of all natural disasters, including floods, hurricanes, severe storms, earthquakes, and wildfires. Natural hazard mitigation is most effective when it is planned for and implemented at the local level, by the entities who are most knowledgeable of local conditions and whose economic stability and safety are at stake. For your information, we are enclosing a copy of a pamphlet describing this nationwide initiative. For additional information on *Project Impact*, please visit our website at **www.fema.gov/impact**.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please call the CCO for your community at the telephone number cited above. If you have any questions regarding this LOMR, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

For: Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

Enclosures

cc: Mr. Randall R. Talley, P.E.
Engineering Unit Manager
Flood Management Policy Planning Unit
Santa Clara Valley Water District

Mr. Michael Liu, P.E.
Floodplain Manager
Development Engineering Division
City of San Jose

Federal Emergency
Management Agency

FACT SHEET

Office of Emergency Information and Media Affairs, Washington, D.C. 20472 (202) 646-4600

PROJECT IMPACT
Building a Disaster Resistant Community

BACKGROUND

PROJECT IMPACT is an initiative developed by FEMA Director James Lee Witt to challenge the country to undertake actions that protect families, businesses and communities by reducing the effects of natural disasters. This initiative includes a national awareness campaign, the selection of pilot communities that demonstrate the benefits of hazard mitigation through a partnership approach, and an outreach effort to businesses and communities using a new guidebook that offers a formula for a community or business to follow to become disaster resistant.

RATIONALE

The increasing number and severity of natural disasters the past decade demands that action be taken to reduce the threat that hurricanes, severe storms, earthquakes, floods and wildfires impose upon the economic stability, economic future and safety of the citizens of the U.S. As the federal agency responsible for emergency management, FEMA is committed to reducing disaster losses by focusing the energy of businesses, citizens, and communities in the U.S. on the importance of reducing their susceptibility to the impact of natural disasters.

There are three primary tenets of the PROJECT IMPACT initiative:

- *Mitigation is a local issue.* It is best addressed by a local partnership that involves government, businesses and private citizens.

- *Private sector participation is essential.* Disasters threaten the economic and commercial growth of our cities, towns, villages and counties. Without the participation of the private sector, comprehensive solutions will not be developed.

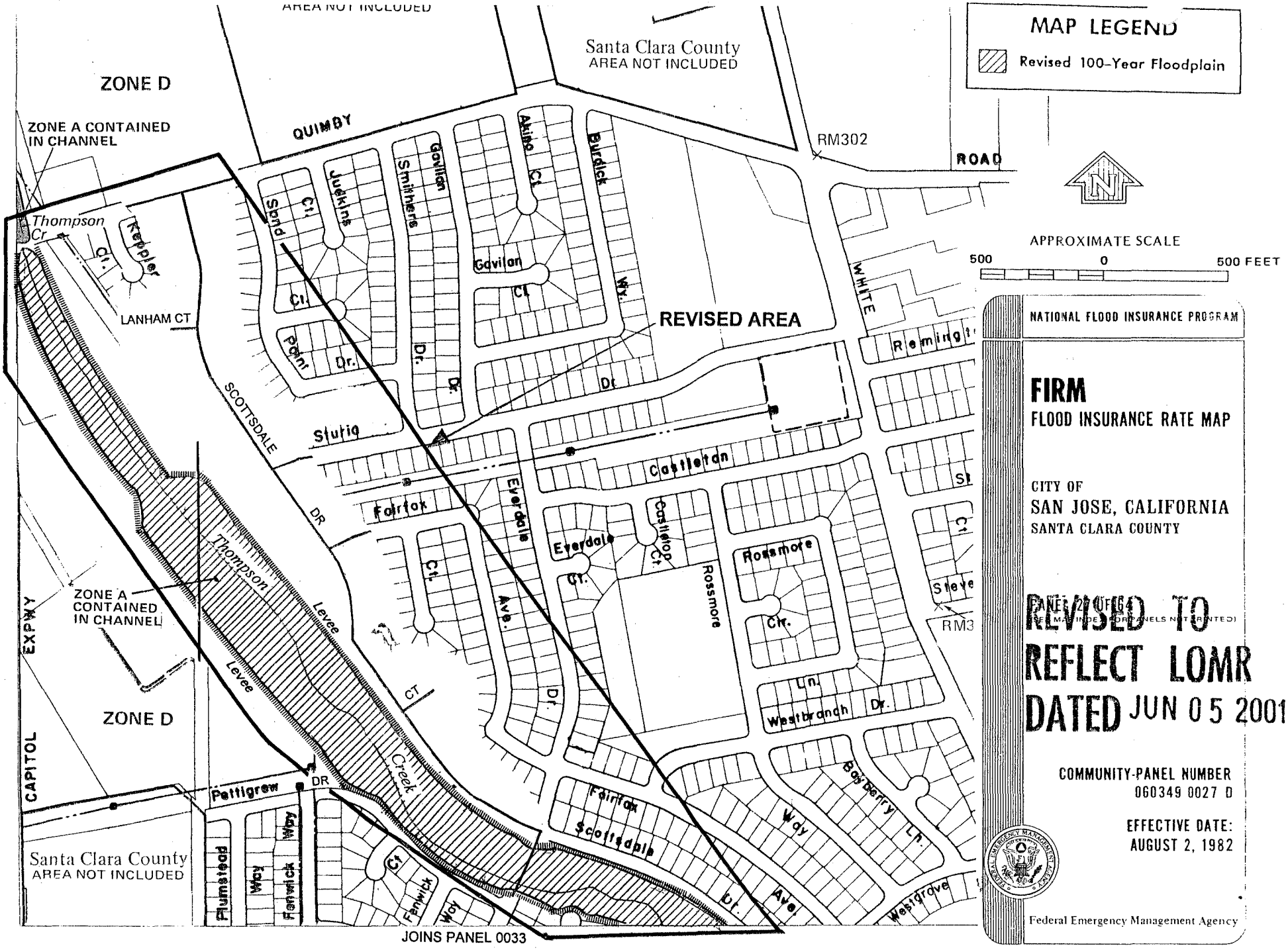
- *Mitigation is a long-term effort that requires long-term investment.* Disaster losses will not be eliminated overnight.

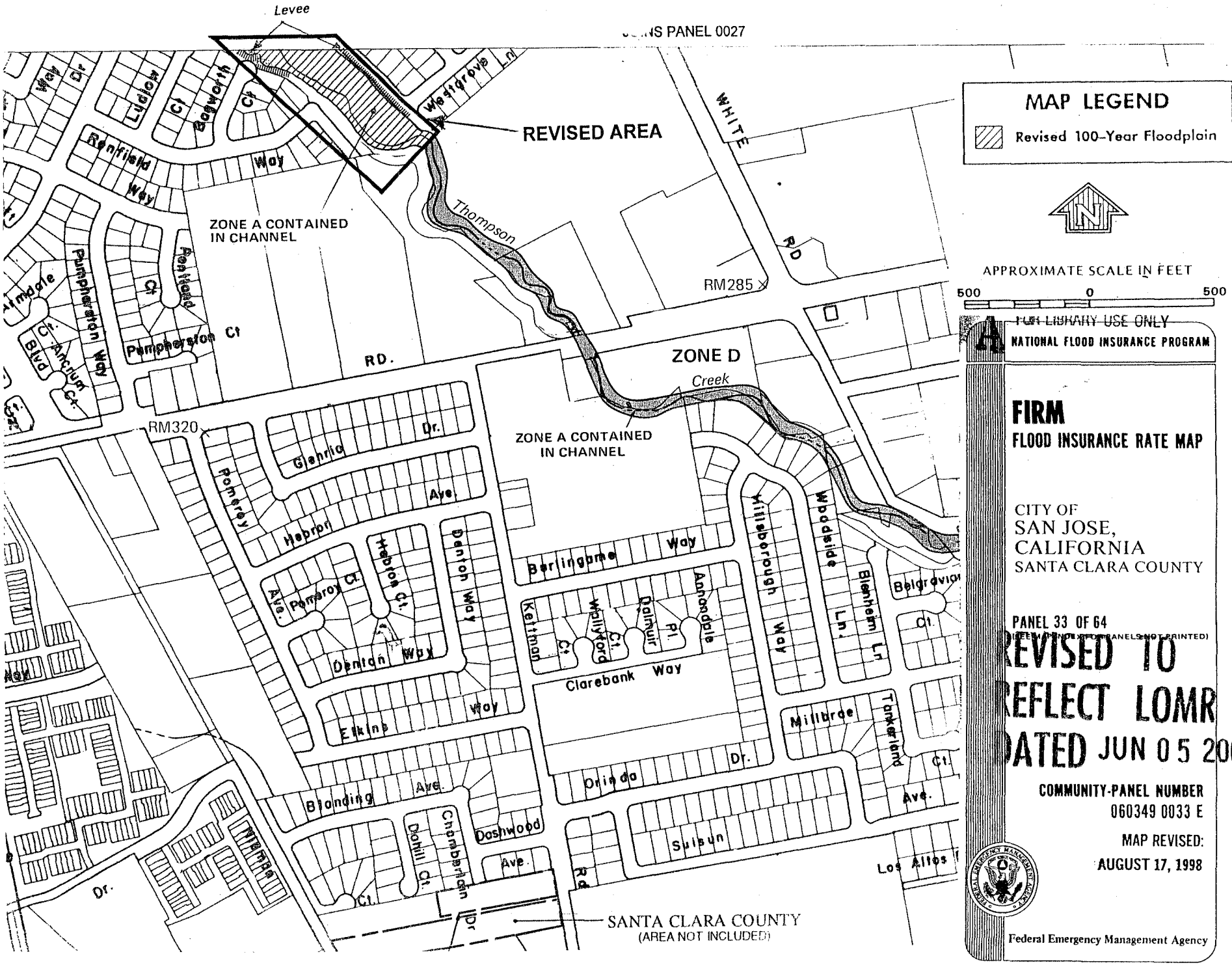
PILOT COMMUNITIES

Director Witt and FEMA have worked closely with seven communities throughout the U.S. to develop a PROJECT IMPACT plan that localities, businesses and citizens can follow to build disaster resistant communities where they live and work. Director Witt will participate in events in each of these communities to congratulate them on their foresight, commitment, and contribution to a disaster resistant nation.

PROJECT IMPACT GUIDEBOOK

The guidebook presents that steps a community can take to become disaster resistant. It also provides examples of the actions and resources available to accomplish this goal.


AREA NOT INCLUDED
Santa Clara County
AREA NOT INCLUDED
ZONE D
ZONE A CONTAINED IN CHANNEL
QUIMBY
RM302
ROAD
Thompson Cr
Keppler
Ct.
LANHAM CT
Spind
Ct.
Juckins
Smithers
Gavilan
Akins Ct.
Burdick
Wy.
Ct.
Pont
Dr.
Dr.
Dr.
Gavilan
Ct.
Dr
REVISED AREA
WHITE
Remingt
SCOTTSDALE
DR
Sturig
Castleton
Fairfax
Everdale
Ct.
Ave.
Dr.
Everdale
Castletop
Ct.
Ct.
Rossmore
Rossmore
Clr.
Ln.
Westbrandh
Dr.
St
Ct.
Steve
RM3
Thompson
Creek
Levee
Levee
ZONE A CONTAINED IN CHANNEL
EXPWY
ZONE D
CAPITOL
CT
Pettigrew
DR
Fairfax
Scottsdale
Dr.
Ave.
Bayberry
Ln.
Way
Westgrove
Santa Clara County
AREA NOT INCLUDED
Plumstead
Way
Fenwick
Way
Ct.
Fenwick
Way
JOINS PANEL 0033
MAP LEGEND
Revised 100-Year Floodplain
APPROXIMATE SCALE
500 0 500 FEET
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CITY OF
SAN JOSE, CALIFORNIA
SANTA CLARA COUNTY
PANEL 0027 OF 0033
(SEE MAP INDEX FOR PANELS NOT PRINTED)
REVISED TO REFLECT LOMR DATED JUN 05 2001
COMMUNITY-PANEL NUMBER
060349 0027 D
EFFECTIVE DATE:
AUGUST 2, 1982
Federal Emergency Management Agency


Levee
...NS PANEL 0027
REVISED AREA
ZONE A CONTAINED IN CHANNEL
ZONE A CONTAINED IN CHANNEL
ZONE D
Thompson Creek
RM285
RM320
RD.
WHITE RD
Pemperton Ct
Pemperton Way
Renfield Way
Lydion Ct
Bagworth Ct
Westgrove Ln
Atmore Ct
Blvd
Anglum Ct.
Glenrio Dr.
Pomeroy Ave.
Hepner Ave.
Pomeroy Ct.
Hebron Ct.
Denton Way
Denton Way
Elkins Way
Berlingame Way
Keltman Ct.
Wallyford Ct.
Dalhuir Pl.
Annandale
Clarebank Way
Millsborough Way
Woodside
Blenheim Ln.
Belgravia Ct
Millbrae
Tankerland Ct.
Orinda Dr.
Blanding Ave.
Dohill Ct.
Chamberlain Dr.
Dashwood Ave.
Suisun Ave.
Los Altos
SANTA CLARA COUNTY
(AREA NOT INCLUDED)
MAP LEGEND
Revised 100-Year Floodplain
APPROXIMATE SCALE IN FEET
500 0 500
FOR LIBRARY USE ONLY
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CITY OF
SAN JOSE,
CALIFORNIA
SANTA CLARA COUNTY
PANEL 33 OF 64
(DELETED AND/OR BLANK PANELS NOT PRINTED)
REVISED TO
REFLECT LOMR
DATED JUN 05 2001
COMMUNITY-PANEL NUMBER
060349 0033 E
MAP REVISED:
AUGUST 17, 1998
Federal Emergency Management Agency

Michael Baker Jr., Inc.
A Unit of Michael Baker Corporation
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304
PHONE: (703) 960-8800
FAX: (703) 960-9125
www.mbakercorp.com

X3005

To: Ms. Sara Duckler

Company: Santa Clara Valley Flood Control District

Fax No: 408-978-0156

From: Patrick Gervais

Date: 5/23/01 Time: 2:00 PM

6 pages sent (including cover sheet)

Comments:

Dear Sara,

I am faxing you a few pages to try to explain the problem that I was discussing with you over the phone. I have attached a memo explaining the issue and what I have done to try to resolve it. I hope that this information comes through okay. Please let me know if it is hard to read and I will try to re-send it. Thanks

Patrick

Please contact us if this fax transmittal letter is not complete. Thank you.

Letter of Instruction

Baker

SUMMARY

CASE NO: 00-09-597P
COMMUNITY: City of San Jose, CA

FLOODING SOURCE: Thompson Creek

IDENTIFIER: Levee improvement project

RESOLUTION: LOMR

SUMMARY:

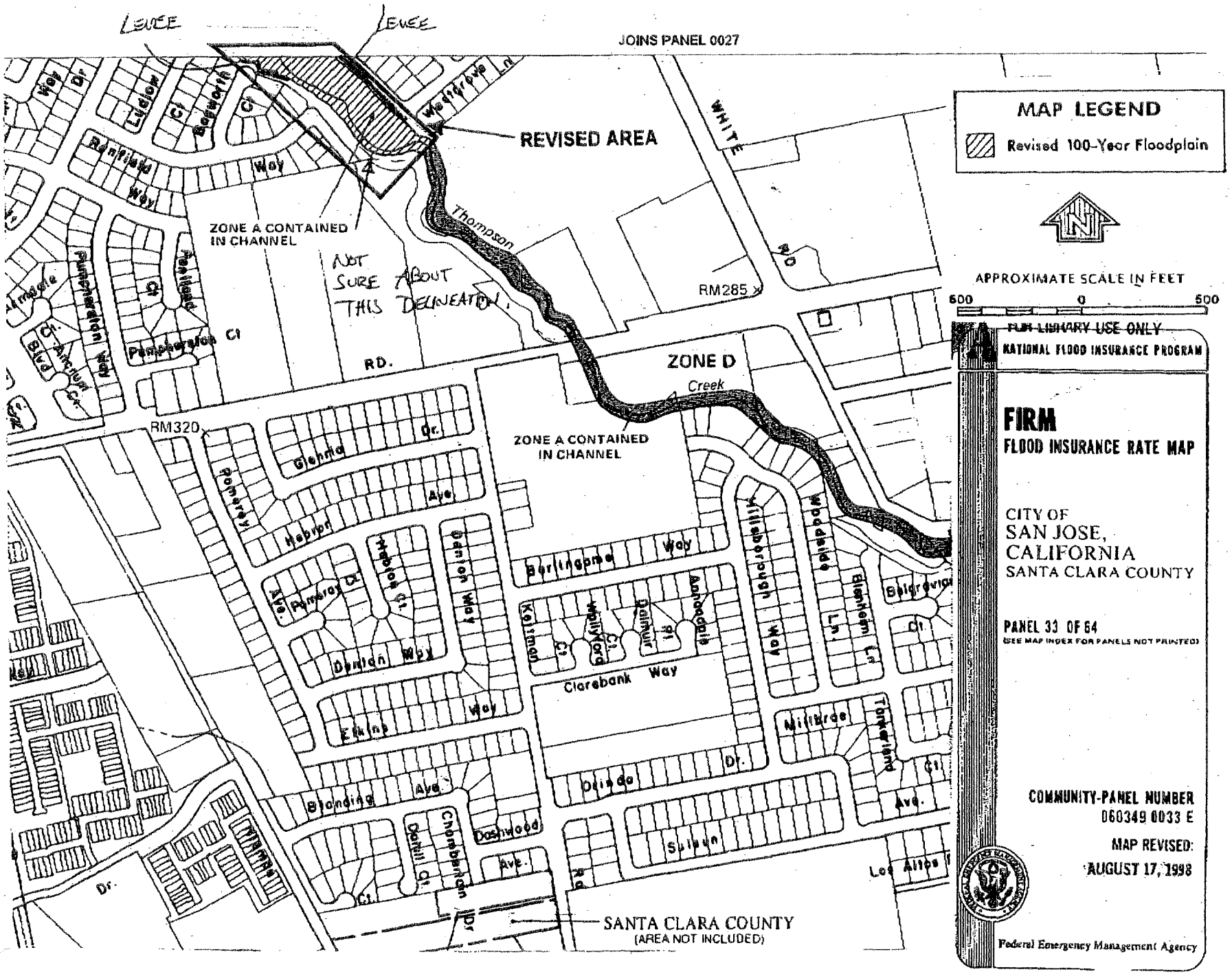
The plans submitted with the LOMR application indicate that the levee will extend to Westgrove Lane on the North side of the creek, and to just past Bogworth Court on the South side of the creek. From the end of the South levee to Quimby road, the revised FIRM will denote a Zone A area contained between levees. However, upstream of the South levee, it is unclear what the delineation of the SFHA will be. The submitted levee improvement plans do not indicate a proposed SFHA boundary for this area, nor do they contain topographic information that would allow me to delineate the SFHA boundary delineation.

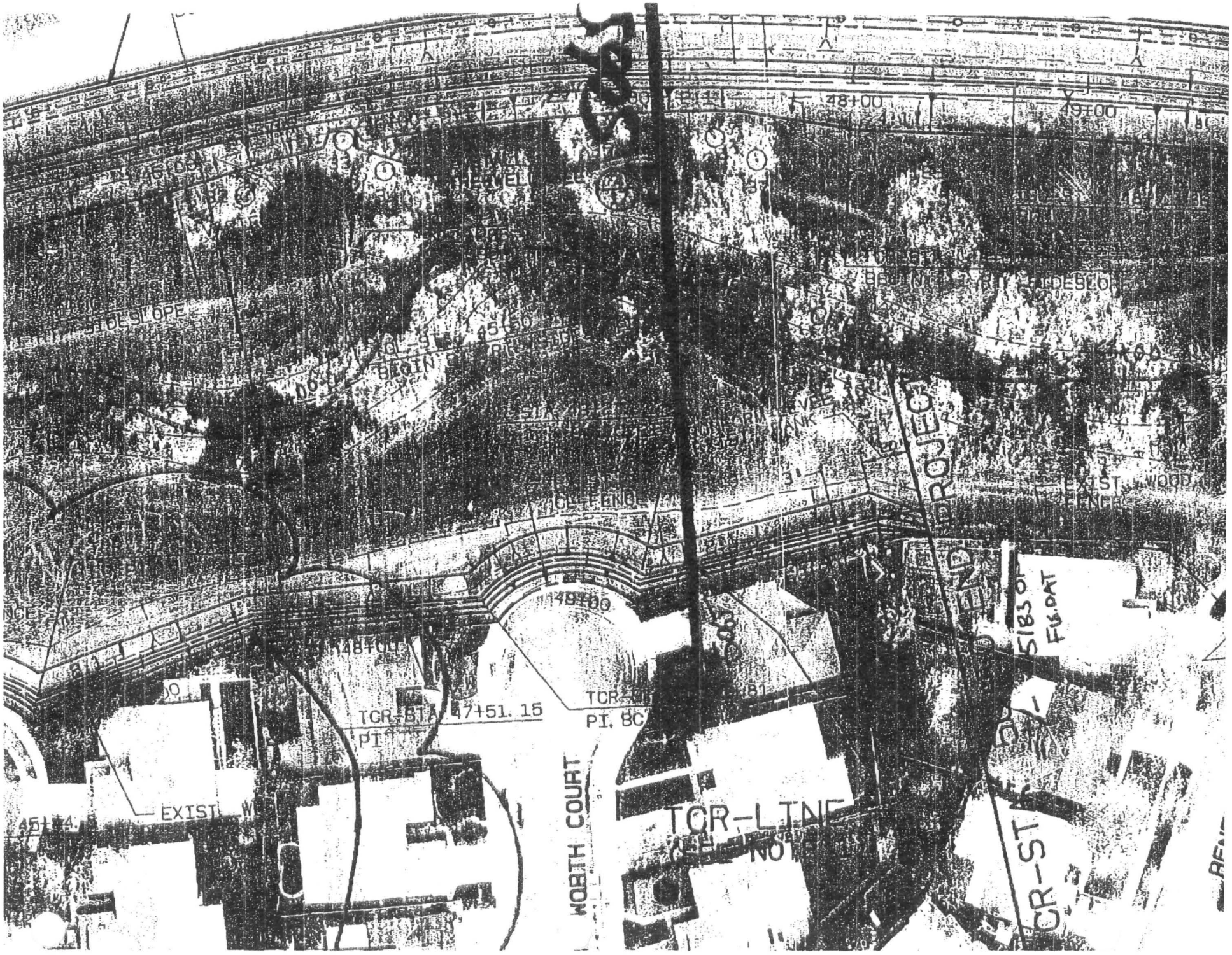
I decided to compare the cross sections in the revised model (THOMPOST.DAT) in this area to the cross sections in the effective model (FIS.DAT), to determine whether or not the effective model information was used. Based on the stationing in FIS.DAT, I determined an approximate location for cross sections 5065, 5360 and 5710 from FIS.DAT, and compared them to the corss-section 6085 from THOMPOST.DAT. the sections from FIS.DAT were not used in the revised model. The cross sections from both the effective and post-project models seemed to indicate that the area to the South of the channel would not be affected. However, there is no topographic data to show whether the computed water surface elevations (WSELs) would overtop the channel banks between the cross sections, and the profile shown on the submitted plans does not give a profile for South bank of the channel.

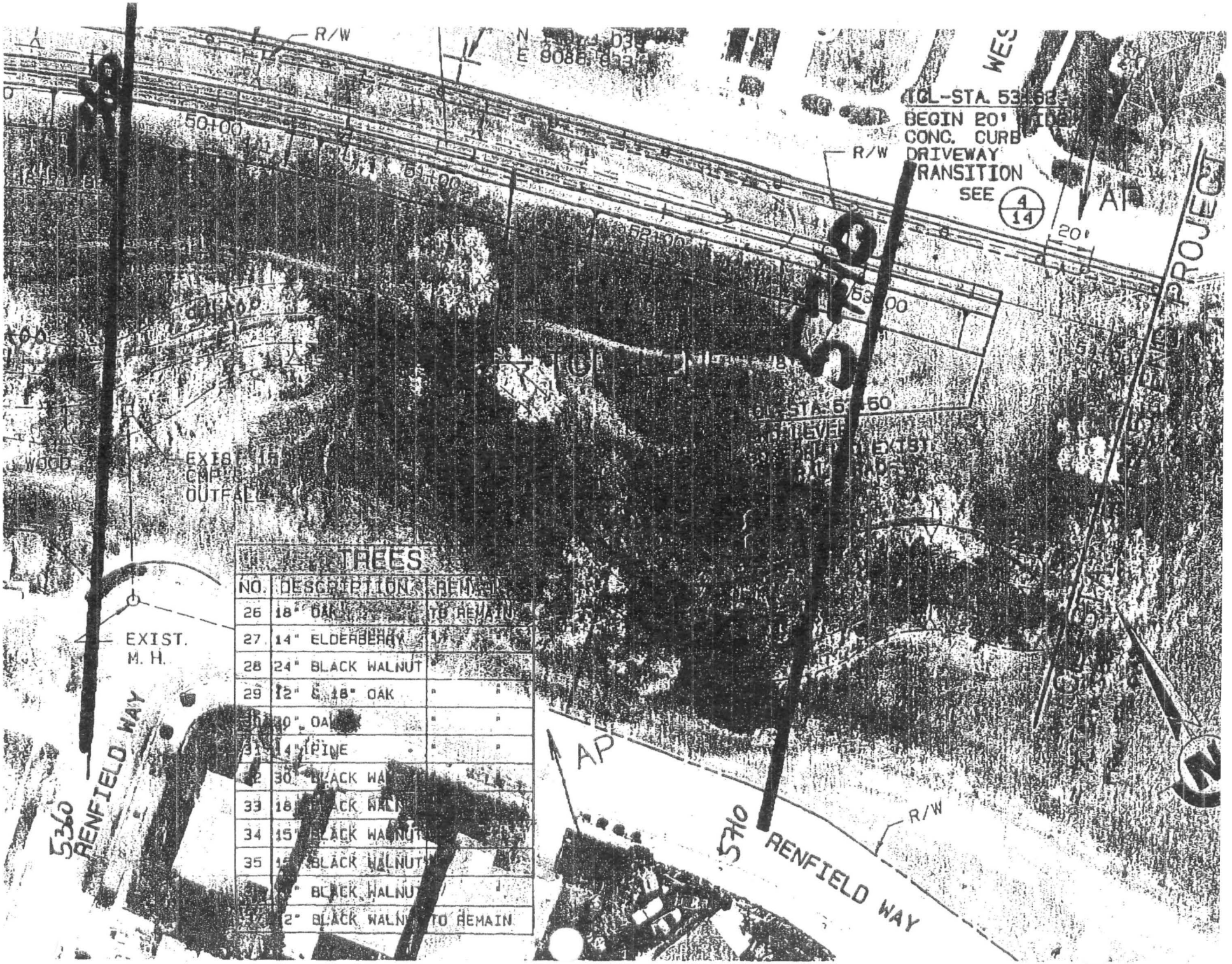
What I need is some topographic information that would allow me to establish whether or not the South bank is overtopped. If you have any grading plans, or street plans for Renfield Way, or any other topographic information for the area it would be most helpful. Please call me at (703) 960-8800 xt. 3005 if you have any questions or comments. Thank You

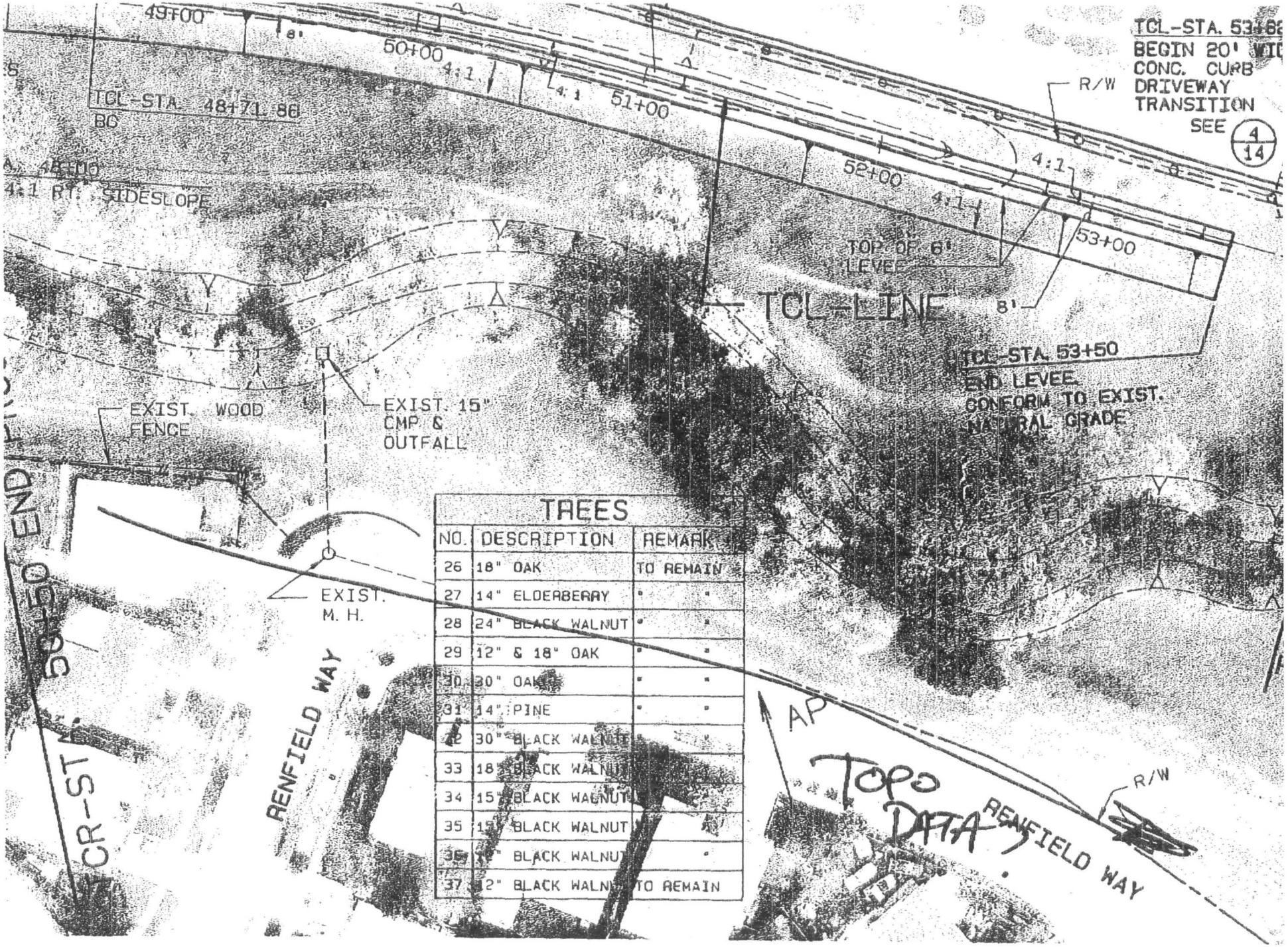
Patrick Gervais

My answer(s) via interview:
① Not requesting a change in that area
② Topo maps in the Thompson Ck. LOMR Report
Interior area


LEVEE
LEVEE
JOINS PANEL 0027
REVISED AREA
ZONE A CONTAINED IN CHANNEL
NOT SURE ABOUT THIS DELINEATION
ZONE D
ZONE A CONTAINED IN CHANNEL
Thompson Creek
WHITE RD.
RM285
RM320
Clarebank Way
SANTA CLARA COUNTY
(AREA NOT INCLUDED)
MAP LEGEND
Revised 100-Year Floodplain
APPROXIMATE SCALE IN FEET
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CITY OF
SAN JOSE,
CALIFORNIA
SANTA CLARA COUNTY
PANEL 33 OF 64
(SEE MAP INDEX FOR PANELS NOT PRINTED)
COMMUNITY-PANEL NUMBER
060349 0033 E
MAP REVISED:
AUGUST 17, 1998
Federal Emergency Management Agency


18+00
19+00
DESLOPE
BEGIN
EXIST. WOOD FENCE
ROUTE 2
5183 OF FG.DAT
48+00
TCR-BEGIN 47+51.15
PI
TCR-
PI, BC
EXIST.
WORTH COURT
TCR-LINE
CR-ST


R/W
50+00
51+00
52+00
53+00
STA. 53+68
BEGIN 20' CONC. CURB DRIVEWAY TRANSITION
SEE 4/14
20'
R/W
PROJECT
EXIST. 15" CMP OUTFALL
WOOD
EXIST. M. H.
AP
5360 RENFIELD WAY
5340 RENFIELD WAY
R/W
TREES
NO. DESCRIPTION REMARKS
26 18" OAK TO REMAIN
27 14" ELDERBERRY "
28 24" BLACK WALNUT "
29 12" & 18" OAK " "
30 10" OAK " "
31 14" PINE " "
32 30" BLACK WALNUT "
33 18" BLACK WALNUT "
34 15" BLACK WALNUT "
35 15" BLACK WALNUT "
" BLACK WALNUT "
2" BLACK WALNUT TO REMAIN



TREES		
NO.	DESCRIPTION	REMARK
26	18" OAK	TO REMAIN
27	14" ELDERBERRY	"
28	24" BLACK WALNUT	"
29	12" & 18" OAK	"
30	30" OAK	"
31	14" PINE	"
32	30" BLACK WALNUT	"
33	18" BLACK WALNUT	"
34	15" BLACK WALNUT	"
35	15" BLACK WALNUT	"
36	12" BLACK WALNUT	"
37	12" BLACK WALNUT	TO REMAIN

Federal Emergency Management Agency

Washington, D.C. 20472

SEP 29 2000

Mr. Randall R. Talley, P.E.
Supervising Engineer
Hydraulics and General Engineering
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686

Dear Mr. Talley:

This responds to your letter dated September 22, 2000, in which you requested an extension for a Letter of Map Revision request for Thompson Creek in the City of San Jose (Case No. 00-09-597P). We have reviewed your request and have granted you an extension. The remaining data requested in our letter dated June 30, 2000, must be submitted by March 30, 2001. Please note that this is the final extension, and we will drop this case if we do not receive all required data by March 30.

If you have any questions concerning FEMA policy, or the National Flood Insurance Program in general, please contact the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

For: Matthew B. Miller, P.E., Chief
Hazards Study Branch
Mitigation Directorate

cc: Mr. Michael Liu, P.E.
Floodplain Manager
Development Engineering Division
City of San Jose

September 22, 2000

Mr. Max H. Yuan, P.E.
Project Engineer
Hazards Study Branch
Mitigation Directorate
Federal Emergency Management Agency
Washington, D.C. 20472

Dear Mr. Yuan:

Subject: Thompson Creek Flood Control Project, Case No. 00-09-597P, City of San Jose, CA, Community No. 060349; Letter of Map Revision

This letter requests an extension of the deadline for submittal of additional data in support of the application for the above-referenced Letter of Map Revision. Your letter of June 30, 2000, requested additional analysis on the interior drainage portion of the application, among other issues. For some of the required analyses, the Santa Clara Valley Water District must have consultants with appropriate expertise, such as a new hydraulic analysis using a National Flood Insurance Program-approved model.

We are negotiating a scope of work with a local consultant. We anticipate that once the contract is approved, the consultant will need an additional 4 to 5 months to adequately complete the work. For this reason, we respectfully request a 9-month extension beyond the 90-day limit granted. Our target completion and submittal date would then be June 30, 2001.

Thank you for your consideration,

Sincerely,

ORIGINAL SIGNED BY

Randall Talley, P.E.
Supervising Engineer
Hydraulics and General Engineering

cc: Mr. Michael Liw, P.E.
Floodplain Manager
Development Engineering Division
City of San Jose
801 North First, Room 308
San Jose, CA 95110-1789

Ms. Sheila M. Norlin
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304

N. Hsueh, S. Duckler, R. Talley

SD:gs:0822p

Federal Emergency Management Agency

Washington, D.C. 20472

JUN 30 2000

Mr. Randall R. Talley, P.E.
Engineering Unit Manager
Flood Management Policy Planning Unit
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686

IN REPLY REFER TO:
Case No.: 00-09-597P
Community: City of San Jose, CA
Community No.: 060349

316-AD

Dear Mr. Talley:

This is in reference to your March 30, 2000, request for a Letter of Map Revision for the above-referenced community. In our earlier letter to you, we indicated additional data might be required to complete our review of the request. The data required to complete our review, which must be submitted within 90 days of the date of this letter, are listed on the enclosed summary.

If we do not receive the required data within 90 days, we will suspend our processing of your request. Any data submitted after 90 days will be treated as an original submittal and will be subject to all submittal/payment procedures, including the flat review and processing fee for requests of this type established by the revised fee schedule that became effective on June 1, 2000. A copy of the notice summarizing the current fee schedule, which was published in the *Federal Register,* is enclosed for your information.

If you are unable to meet the 90-day deadline for submittal of required items, and would like the Federal Emergency Management Agency (FEMA) to continue processing your request, you must request an extension of the deadline. This request must be submitted to our Mapping Coordination Contractor in writing and must provide (1) the reason why the data cannot be submitted within the requested timeframe, and (2) a new date for the submittal of the data. We receive a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, the fees will be forfeited for any request for which neither the requested data nor a written extension request is received within 90 days.

If you have any questions regarding this matter, please contact the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max. H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

Enclosures

cc: Mr. Michael Liu, P.E.
Floodplain Manager
Development Engineering Division
City of San Jose

Summary of Additional Data Required to Support a
Letter of Map Revision

Case No.: 00-09-597P

Requester: Mr. Randall R. Talley, P.E.

Community: City of San Jose, CA

Community No.: 060349

The issues listed below must be addressed before we can continue the review of your request.

1. The submitted work map entitled "Attachment A – Map and Construction Plan for Thompson Creek, Lower Silver Creek, and Quimby Creek," prepared by the Santa Clara Valley Water District, dated November 1980, does not provide essential information required to complete our detailed review of this request. Please submit a work map that includes the following information:

   a. Boundary delineations of the effective and proposed Special Flood Hazard Area (SFHA), the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood)

   b. Topographic contour information used for the base floodplain boundary delineations

   c. Locations and alignments of Cross Sections 30262, 30947, 31447, 6085, 6607, 6885, and 7041

   d. All other applicable items listed on page 1 of Application/Certification Form 5, entitled "Riverine/Coastal Mapping Form" (copy enclosed)

2. Our detailed review revealed that the submittal did not include elevation information for the existing floodwall at Everdale Drive. Please provide elevation information for the floodwall, certified by a professional engineer.

3. Please address the following issues with respect to the submitted interior drainage analysis:

   a. The computer program entitled "Mark Thomas Storm Computer Program," developed by Mark Thomas and Co., Inc., is not an approved model for use in the National Flood Insurance Program. Please submit a revised hydraulic analysis using a model from the enclosed list of approved models.

   b. The submitted undated topographic work map entitled "Attachment A," prepared by the Santa Clara Valley Water District, shows ponding areas in Watersheds 1 and 2 for which no overflow analysis was submitted. Please submit an overflow analysis for the ponding areas.

   c. Please submit topographic information to support the boundary delineations and computed water-surface elevation of the ponding areas shown in Watersheds 1, 2, 3, and 4. In addition, please submit a revised topographic work map, certified by a registered professional engineer, to show the overflow path and affected area from each ponding area.

   d. The peak flow of the hydrograph used in the interior drainage analysis does not correspond to the peak flow given in the effective Flood Insurance Study (FIS) report and used in the submitted HEC-2 hydraulic model. Please submit a revised analysis using a hydrograph calibrated to match the peak flow given in the effective FIS report.

e. Our detailed review revealed a discrepancy between the pipe lengths used in the submitted storm drain analysis and those shown on the above-referenced topographic work map. Please resolve this discrepancy.

f. It is unclear why the area west of Thompson Creek, south of Quimby Road, and north of Watershed 3 was excluded from the interior drainage analysis. Please submit a revised analysis that includes this area, or documentation to show that the drainage in this area is not affected by the levee system.

4. The submitted operation and maintenance plan entitled "Attachment F – Maintenance Program Guidelines, Channel Maintenance Program Guidelines Extracted from 'Thompson Creek Planning Study (Quimby Road to Westgrove Lane),'" prepared by the Santa Clara Valley Water District, dated August 1988, does not detail the flood warning system that will be used to notify the community of a potential flooding situation. Please submit a revised operation and maintenance plan that details the flood warning system and identifies the agency responsible for its operation.

Please send the required data directly to our Mapping Coordination Contractor at the following address:

Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304

Attention: Ms. Sheila M. Norlin
Telephone: (703) 317-3054
Fax: (703) 960-9125

For identification purposes, you must include the case number referenced above on all correspondence.

FEDERAL EMERGENCY MANAGEMENT AGENCY ANNOUNCES USER FEES FOR FLOOD MITIGATION PRODUCTS

Through a Notice published in the *Federal Register* on January 11, 1999, the Federal Emergency Management Agency (FEMA) announced changes to the fee schedule for several of the products it provides to the public in support of the National Flood Insurance Program (NFIP). These changes, which became effective on March 1, 1999, were made to ensure full reimbursement to FEMA of the funds that are expended in reviewing and processing requests for Conditional and Final Map Revisions. Through a rule change published in the *Federal Register* on September 23, 1999, FEMA revised the exemptions listed under Section 72.5 of the NFIP regulations. Copies of both *Federal Register* publications are attached.

The current fee schedule for requests for Conditional Letters of Map Revision (CLOMRs) and Final Map Revisions—Letters of Map Revision (LOMRs) and Physical Map Revisions (PMRs)—is shown below.

Fee Schedule for CLOMR Requests

Request based on new hydrology, bridge, culvert, channel, or combination thereof	$3,100
Request based on levee, berm, or other structural measure	$4,000

Fee Schedule for LOMR and PMR Requests

Request based on bridge, culvert, channel, or combination thereof	$4,000
Request based on levee, berm, or other structural measure	$4,700
Request based on as-built information submitted as followup to CLOMR	$3,400

Additional copies of both *Federal Register* publications may be obtained electronically from the National Archives and Records Administration site on the World Wide Web at http://www.access.gpo.gov/su_docs/aces/aces140.html. Interested persons who do not have access to the Internet may obtain paper copies of the Notice, free of charge, by calling the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

ACTION: Notice.

SUMMARY: This notice contains the revised fee schedules for processing certain requests that you (the requester) make for changes to National Flood Insurance Program (NFIP) maps and for processing requests for Flood Insurance Study (FIS) backup data. The changes in the fee schedules will allow us (FEMA) to reduce further the expenses to the NFIP by recovering more fully the costs associated with (1) processing conditional and final map change requests and (2) retrieving, reproducing, and distributing technical and administrative support data related to FIS analyses and mapping.

EFFECTIVE DATE: The revised fee schedules are effective for all requests dated March 1, 1999, or later.

FOR FURTHER INFORMATION CONTACT: Matthew B. Miller, P.E., Chief, Hazards Study Branch, Mitigation Directorate, 500 C Street SW., Washington, DC 20472; (202) 646-3461 or by facsimile at (202) 646-4596 (not toll-free calls), or (email) *matthew.miller@fema.gov.*

SUPPLEMENTARY INFORMATION: This notice contains the revised fee schedules for processing certain requests for changes to NFIP maps and for processing requests for FIS backup data. The revised fee schedule for map changes is effective for all requests dated March 1, 1999, or later. It supersedes the current fee schedule, which was established on March 10, 1997.

The revised fee schedule for requests for FIS backup data also is effective for all requests dated March 1, 1999, or later. It supersedes the current fee schedule, which was established on March 10, 1997.

To develop the revised fee schedules, we evaluated the actual costs of reviewing and processing requests for Conditional Letters of Map Amendment (CLOMAs), Conditional Letters of Map Revision Based on Fill (CLOMR-Fs), Conditional Letters of Map Revision (CLOMRs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs), and Physical Map Revisions (PMRs) and requests for FIS backup data.

As we indicated in the **Federal Register** notice published on February 6, 1997, a primary component of the fees is the prevailing private-sector rates charged to us for labor and materials. Because these rates and the actual review and processing costs may vary from year to year, we will evaluate the fees periodically and publish revised fee schedules, when needed, as notices in the **Federal Register**.

Fee Schedule for Requests for Conditional Letters of Map Amendment and Conditional and Final Letters of Map Revision Based on Fill

Based on a review of actual cost data for Fiscal Year 1997, we maintained the following flat user fees, which are to be submitted with all requests:

- Request for single-lot/single-structure CLOMA, CLOMR-F, and LOMR-F—$400.
- Request for single-lot/single-structure LOMR-F based on as-built information (CLOMR-F previously issued by FEMA)—$300.
- Request for multiple-lot/multiple-structure CLOMA—$700.
- Request for multiple-lot/multiple-structure CLOMR-F and LOMR-F—$800.
- Request for multiple-lot/multiple-structure LOMR-F based on as-built information (CLOMR-F previously issued by FEMA)—$700.

Fee Schedule for Requests for Conditional Map Revisions

Unless the request is otherwise exempted under 44 CFR 72.5, you (the requester) must submit the flat user fees shown below with requests for CLOMRs dated March 1, 1999, or later that are not based on structural measures on alluvial fans. These fees are based on a review of actual cost data for Fiscal Year 1997.

- Request based on new hydrology, bridge, culvert, channel, or combination thereof—$3,100.
- Request based on levee, berm, or other structural measure—$4,000.

Fee Schedule for Requests for Map Revisions

Unless the request is otherwise exempted under 44 CFR 72.5, you must submit the flat user fees shown below with requests for LOMRs and PMRs dated March 1, 1999, or later that are not based on structural measures on alluvial fans. These fees are based on a review of actual cost data for Fiscal Year 1997.

- Request based on bridge, culvert, channel, or combination thereof—$4,000.
- Request based on levee, berm, or other structural measure—$4,700.
- Request based on as-built information submitted as followup to CLOMR—$3,400.
- Request based solely on submission of more detailed data—$3,100.

Fees for Conditional and Final Map Revisions Based on Structural Measures on Alluvial Fans

Based on a review of actual cost data for Fiscal Year 1997, we maintained $5,000 as the initial fee for your requests for LOMRs and CLOMRs based on structural measures on alluvial fans. We also will continue to recover the remainder of the review and processing costs by invoicing the requester before issuing a determination letter, consistent with current practice. The prevailing private-sector labor rate charged to we ($50 per hour) will continue to use to calculate the total reimbursable fees.

Fee Schedule for Requests for Flood Insurance Study Backup Data

You must submit the user fees shown below with your requests for FIS backup data dated March 1, 1999, or later. These fees are based on a review of actual cost data for Fiscal Year 1997. They are based on the complete recovery of our costs for retrieving, reproducing, and distributing the data, as well as a pro rata share of the costs for maintaining the data and operating the fee reimbursement system.

As under the previous fee schedule, all entities except the following will be charged for requests for FIS backup data: our Study Contractors; our Technical Evaluation Contractors; the Federal agencies involved in performing studies and restudies for us (i.e., U.S. Army Corps of Engineers, U.S. Geological Survey, Natural Resources Conservation Service, and Tennessee Valley Authority); communities that have supplied the Digital Line Graph base to us and request the Digital Line Graph data (Category 6 below); State NFIP Coordinators if the data have not already been provided on microfiche or CD-ROM or if the State is actively involved in performing a study or restudy that will be used by us to update NFIP maps. The only other exception is that one copy of the FIS backup data will be provided to a community free of charge if the data are requested during the statutory 90-day appeal period for an initial or revised FIS for that community.

We have established seven categories into which we separate requests for FIS backup data. These categories are:

(1) *Category 1*—Paper copies, microfiche, or diskettes of hydrologic and hydraulic backup data for current or historical FISs

(2) *Category 2*—Paper or mylar copies of topographic mapping developed during FIS process

(3) *Category 3*—Paper copies or microfiche of survey notes developed during FIS process

(4) *Category 4*—Paper copies of individual Letters of Map Change

(5) *Category 5*—Paper copies of preliminary Flood Insurance Rate Map

FEDERAL EMERGENCY MANAGEMENT AGENCY

44 CFR Part 72

RIN 3067–AC88

National Flood Insurance Programs; Procedures and Fees for Processing Map Changes

AGENCY: Federal Emergency Management Agency (FEMA).

ACTION: Final rule.

SUMMARY: This final rule revises the National Flood Insurance program (NFIP) regulations concerning the procedures and fees for processing changes to NFIP maps by removing the fee payment requirements for processing certain changes. Under this rule, map change requests based on flood hazard information meant to improve upon that shown on the flood map or within the flood study will be exempt from review and processing fees. Improvements to flood maps or studies, which partially or wholly incorporate man-made modifications within the special flood hazard area, will not be exempt from review and processing fees.

EFFECTIVE DATE: This rule is effective on September 23, 1999.

FOR FURTHER INFORMATION CONTACT: Matthew B. Miller, Chief, Hazards Study Branch, Mitigation Directorate, Federal mergency Management Agency, 500 C Street SW, Washington, DC 20472, by telephone at (202) 646–3461, by facsimile at (202) 646–4596 (not toll-free calls), or by e-mail at matthew.miller@fema.gov.

SUPPLEMENTARY INFORMATION: This final rule revises the NFIP regulation governing fee requirements for processing certain changes to NFIP maps. We established the current fee requirements under a final rule published in the **Federal Register** on February 6, 1997, 62 FR 5734.

Under current standards, request are exempt from submitting review and processing fees for:

(a) Requests for map changes based on mapping or study analysis errors;

(b) Requests for map changes based on the effects of natural changes within Special Flood Hazard Areas (SFHAs);

(c) Request for a Letter of Map Amendment (LOMA);

(d) Requests for map changes based on federally sponsored flood-control projects where 50 percent or more of the project's costs are federally funded;

(e) Requests for map changes based on detailed hydrologic and hydraulic tudies conducted by Federal, State, or ocal agencies to replace approximate studies conducted by FEMA and shown on the effective Flood Insurance Rate Map (FIRM).

This rule maintains the fee exemptions for map change requests in Items (a) through (e) above, and adds a new exemption in subsection 72.5(f), which exempts requesters from paying review and processing fees when the aim of the request is to improve flood hazard information shown on the flood map or within the flood study. Proposed improvements to the flood hazard information that partially or wholly incorporate man-made modifications within the special flood hazard area will not be exempt from review and processing fees.

These final revisions to the NFIP regulations are a result of our continuing reappraisal of the NFIP in order to achieve greater administrative and fiscal effectiveness and to encourage sound floodplain management.

Administrative Procedure Act Determination.

We are publishing this final rule without opportunity for prior public comment under the Administrative Procedure act, having determined that it is a rule of agency procedure or practice excepted under 5 U.S.C. 553(b)(A). We are further making this rule effective immediately upon publication in the **Federal Register** under 5 U.S.C. 553(d)(1), for substantive rules that grant or recognize an exemption.

National Environmental Policy Act

44 CFR Part 10, Environmental Consideration categorically excludes this final rule from its requirements. We have not prepared an environmental impact assessment.

Regulatory Flexibility Act

As Director, I certify that this final rule does not have a significant economic impact on a substantial number of small entities in accordance with the Regulatory Flexibility Act, 5 U.S.C. *et seq.*, because it is not expected (1) *to* have significant secondary or incidental effects on a substantial number of small entities, nor (2) to create any additional burden on small entities. We have not prepared a regulatory flexibility analysis.

Paperwork Reduction Act.

This rule does not involve any collection of information for the purposes of the Paperwork Reduction Act.

Executive Order 12866, Regulatory Planning and Review

42 U.S.C. 4014(f), Promulgation of this final rule is required by statute, which also specifies the regulatory approach taken in the final rule. To the extent possible under the statutory requirements of 42 U.S.C. 4014(f), this final rule adheres to the principles of regulation as set forth in Executive Order 12866, Regulatory Planning and Review.

Congressional Review of Agency Rulemaking.

We have sent this final rule to the U.S. Congress and to the General Accounting Office under the Congressional Review of Agency Rulemaking Act, 5 U.S.C. 801 *et seq.* The rule is not a "major rule" within the meaning of that Act. It does not result in, nor is it likely to result in an annual effect on the economy of $100,000,000 or more. It will not result in a major increase in costs or prices for consumers; individual industries; Federal, State, or local government agencies; or geographic regions. It will not have "significant adverse effects" on competition, employment, investment, productivity, or innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises.

This final rule is exempt (1) From the requirements of the Regulatory Flexibility Act, as certified previously, and (2) from the Paperwork Reduction Act.

This rule is not an unfunded Federal mandate within the meaning of the Unfunded Mandates Reform Act of 1995, Pub. L. 104–4. The rule does not meet the $100,000,000 threshold of that Act, and any enforceable duties are imposed as a condition of Federal assistance or a duty arising from participation in a voluntary Federal program.

List of Subjects in 44 CFR Part 72

Administrative practice and procedure, Flood insurance, Floodplains, and Reporting and recordkeeping requirements.

Accordingly, we amend Part 72 as follows:

PART 72—PROCEDURES AND FEES FOR PROCESSING MAP CHANGES

1. The authority citation for part 72 continues to read as follows:

Authority: 42 U.S.C. 4001 *et seq.*, Reorganization Plan No. 3 of 1978, 43 FR 41943, 3 CFR, 1978 Comp., p. 329; E.O. 12127, 44 FR 19367, 3 CFR, 1979 Comp., p. 376.

Need Information on FEMA FLOOD HAZARD MAPS?

CONTACT 1-877-FEMA MAP

(Toll Free 1-877-336-2627)

NFIP
National Flood Insurance Program
Administered by FEMA

This release is intended to acquaint the public with the Federal Emergency Management Agency's new toll-free number established to respond to questions regarding National Flood Insurance Program (NFIP) Flood Hazard maps, including:

- How do I go about getting a Letter of Map Amendment (LOMA)? A Letter of Map Revision Based on Fill (LOMR-F)? A Letter of Map Revision (LOMR)?
- What is the status of my request for a LOMA? LOMR-F? Study?
- How long does it take to get the map revised?
- Did FEMA receive my request for a Letter of Map Amendment?
- I was just told by my lender that my house is in a floodplain and I need flood insurance, what are my options?
- Was a LOMA ever issued for my property?
- Has the National Flood Insurance Program Flood Hazard map for my community been revised?

The following procedures have been established by FEMA for changing and correcting the NFIP Flood Hazard maps. They are: Letters of Map Amendment (LOMAs), Letters of Map Revision(LOMRs), Letters of Map Revision Based on Fill (LOMR-Fs), and Physical Map Revisions.

As a result of numerous requests for revisions or corrections to the NFIP Flood Hazard maps, FEMA has assigned a dedicated staff of trained professionals to respond to the public's requests for information on the procedures to revise or correct the NFIP Flood Hazard maps.

If you have any questions regarding the NFIP Flood Hazard maps or need current information and facts on FEMA Mapping Procedures, call 1-877-FEMA-MAP.

Below are additional Toll-Free numbers that can be used to obtain other information regarding the NFIP and its products.

- For information about the NFIP's Preferred Risk Policy, ask your insurance agent or company, or call the NFIP's toll-free number at 1-800-427-9662.

- For any current FEMA publications, call FEMA's Publication Center at 1-800-480-2520.

- For answers to flood insurance related questions, call the National Flood Insurance Telephone Response Center at 1-800-427-4661.

- For ordering printed copies of effective NFIP Flood Hazard maps and related documents, call the FEMA Map Service Center at 1-800-358-9616.

Additional information on flood insurance and other FEMA programs and activities is available on the FEMA World Wide Web Site (http://www.FEMA.gov) and from FEMA's 24-hour-FAX-on-Demand system at (202) 646-FEMA. TDD# 1-800-427-5593.

Edition 1.0 2/25/99

Numerical Models Accepted by FEMA for NFIP Usage

(shown in descending order of approximate usage within each type)

TYPE	PROGRAM	DEVELOPED BY	AVAILABLE FROM	COMMENTS
Coastal Models:				
Coastal Storm Surges	FEMA Surge (1988)	Tetra Tech, Inc.; Engineering Methods & Applications; Greenhorne & O'Mara; Camp, Dresser & McKee, Inc.	Dewberry & Davis, METS Division 8401 Arlington Blvd. Fairfax, VA 22031	Incorporates modified NWS-23 model for hurricanes and Joint Probability Method. Reportedly more accurate for water elevations than water currents.
	ODISTIM (1975)	Coastal Consultants, Inc.	Dewberry & Davis, METS Division 8401 Arlington Blvd. Fairfax, VA 22031	Computes wind-driven surges propagating in estuaries or rivers described by one-dimensional elements, but only for northeasters since wind direction is fixed.
	Northeaster Model (1978)	Stone & Webster Engineering Corp.	Dewberry & Davis, METS Division 8401 Arlington Blvd. Fairfax, VA 22031	Accommodates asymmetrical geometry for extratropical storms but requires separate program to compute resultant coastal surge for winds and pressures.
	FLOW2D (1975)[1]	Resource Analysis, Inc.	Camp, Dresser, & McKee, Inc. Ten Cambridge Center Cambridge, MA 02142	Unsteady flood flow for estuaries and floodplains, but no direct wind effects are considered.
	TABS	U.S. Army Corps of Engineers	Coastal Engineering Research Center Department of the Army Waterways Experiment Station Corps of Engineers 3909 Halls Ferry Road Vicksburg, MS 39180-6199	Two-dimensional steady/unsteady flow model.
Coastal Wave Heights	WHAFIS 3.0 (1988)	Dames & Moore, revised by Greenhorne & O'Mara	Dewberry & Davis, METS Division 8401 Arlington Blvd. Fairfax, VA 22031	Defines wave heights associated with 100-year flood in coastal areas using modern wave action treatment; incorporates 1977 NAS recommendations on basic approximations for wind speeds, wave breaking criterion, and controlling wave height.
	WHAFIS 3.0 GL (1993)	Dames & Moore, Greenhorne & O'Mara, Dewberry & Davis	Dewberry & Davis, METS Division 8401 Arlington Blvd. Fairfax, VA 22031	Identical wave treatments as WHAFIS 3.0, but with programmed reduction of wind speeds for U.S. shorelines of the Great Lakes.
	RCPWAVE (1986)	U.S. Army Corps of Engineers	Coastal Engineering Research Center Department of the Army Waterways Experiment Station Corps of Engineers 3909 Halls Ferry Road Vicksburg, MS 39180-6199	Treats linear, monochromatic waves propagating over grid giving coastal bathymetry, providing nearshore wave heights pertinent to proper spacing between transects or to magnitudes of wave setup.

[1]This model is acceptable for coastal storm surge applications only.

Numerical Models Accepted by FEMA for NFIP Usage

(shown in descending order of approximate usage within each type)

TYPE	PROGRAM	DEVELOPED BY	AVAILABLE FROM	COMMENTS
Coastal Models (cont'd):				
Coastal Wave Effects	RUNUP 2.0 (1990)	Stone & Webster Engineering Corp., revised by Dewberry & Davis	Dewberry & Davis, METS Division 8401 Arlington Blvd. Fairfax, VA 22031	Executes 1978 guidance by USACE defining wave runup on shore barrier with specified approach and storm conditions; mean wave description determines mean runup elevation.
	GLWRM (1992)	U.S. Army Corps of Engineers	Department of the Army Detroit District, Corps of Engineers 477 Michigan Avenue Detroit, MI 48266	Developed particularly to analyze wave runup for the three types of situations most frequently encountered on U.S. shorelines of the Great Lakes: sand beach, sloping riprap revetment, and vertical wall.
	EROSION (1988)	Dewberry & Davis	Dewberry & Davis, METS Division 8401 Arlington Blvd. Fairfax, VA 22031	Compares sand dune cross section to 540 ft^2 rule and computes eroded geometry for 100-year flood as either duneface retreat or dune removal by optional methods. Presently needs revisions to improve model and to provide graphics.
	ACES 1.07 (1992)	U.S. Army Corps of Engineers	Coastal Engineering Research Center Department of the Army Waterways Experiment Station Corps of Engineers 3909 Halls Ferry Road Vicksburg, MS 39180-6199	Includes Goda's theory for irregular wave setup near the shore, and Kriebel's treatment of dune erosion during a storm.

Numerical Models Accepted by FEMA for NFIP Usage

updated December 8, 1999

(shown in descending order of approximate usage within each type)

TYPE	PROGRAM	DEVELOPED BY	AVAILABLE FROM	COMMENTS
Hydrologic Models: Determination of Flood Hydrographs				
Single Event	HEC-1 4.0.1 and up[2] (May 1991)	U.S. Army Corps of Engineers	Water Resources Support Center[3] Corps of Engineers Hydrologic Engineering Center (HEC) 609 Second Street Davis, CA 95616-4687	Flood hydrographs at different locations along streams. Calibration runs preferred to determine model parameters.
	HEC-HMS 1.0 (March 1998)	U.S. Army Corps of Engineers	U.S. Army Corps of Engineers Hydrologic Engineering Center 609 Second Street Davis, CA 95616-4687 http://www.hec.usace.army.mil/	The Hydrologic Modeling System provides a variety of options for simulating precipitation-runoff processes. It has a capability to use gridded rainfall data to simulate runoff. HEC-HMS 1.0 does not have the capability to route flow through reservoir structures such as spillways, low-level outlets, and dam crest. A rating curve, developed separately, and supporting data on how the rating curve was developed, must be supplied. It does not provide snowmelt and snowfall functions; it cannot be used for areas where snowmelt is an important flood hazard source and must be considered in estimation of flood discharges.
	TR-20 (February 1992)	U.S. Department of Agriculture, Natural Resources Conservation Service	U.S. Department of Commerce National Technical Information Service 5285 Port Royal Road Springfield, VA 22161	Flood hydrographs at different locations along streams. Calibration runs preferred to determine model parameters.
	TR-55 (June 1986)	U.S. Department of Agriculture, Natural Resources Conservation Service	U.S. Department of Commerce National Technical Information Service 5285 Port Royal Road Springfield, VA 22161	Peak discharges and flood hydrographs at a single location.
	DBRM 3.0 (1993)	Mr. Bernard L. Golding, P.E. Consulting Water Resources Engineer Orlando, FL	Center for Microcomputers in Transportation (McTrans) University of Florida 512 Weil Hall Gainesville, FL 32611-6585	Flood hydrographs at different locations along streams. Calibration runs preferred to determine model parameters.
	HYMO	U.S. Department of Agriculture, Natural Resources Conservation Service	U.S. Department of Commerce National Technical Information Service 5285 Port Royal Road Springfield, VA 22161	Flood hydrographs at different locations along streams. Calibration runs preferred to determine model parameters.
	AHYMO 97 (August 1997)	Albuquerque Metropolitan Arroyo Flood Control Authority, Anderson-Hydro	Anderson-Hydro 13537 Terragon Drive, NE Albuquerque, NM 87112	Flood hydrographs at different locations along streams. The default parameters in the model are only applicable to the Albuquerque metro area.
	Colorado Urban Hydrograph Procedure (CUHPF/PC) (May 1996)	Denver Urban Drainage and Flood Control District	Denver Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, Colorado 80211	Flood hydrographs at different locations along streams. The default parameters in the model are only applicable to the Denver metro area. Hydrographs are routed using UDSWM2-PC (a modified version of the Runoff Block of EPA's SWMM).
Continuous Event	DR3M (October 1993)	U.S. Geological Survey	U.S. Geological Survey National Center 12201 Sunrise Valley Drive Reston, VA 22092	Calibration to actual flood events required. The web page is at: http://water.usgs.gov/software/surface_water.html
	HSPF 10.10 and up (December 1993)	U.S. Environmental Protection Agency, U.S. Geological Survey	Center for Exposure Assessment Modeling U.S. Environmental Protection Agency Office of Research and Development Environmental Research Laboratory 960 College Station Road Athens, GA 30605-2720	Calibration to actual flood events required. The web page is at: http://water.usgs.gov/software/surface_water.html

[2]The enhancement of these programs in editing and graphical presentation can be obtained from several private companies.
[3]Program is typically distributed by vendors and may not be available through HEC. A list of vendors may be obtained through HEC.

Numerical Models Accepted by FEMA for NFIP Usage updated December 8, 1999

(shown in descending order of approximate usage within each type)

TYPE	PROGRAM	DEVELOPED BY	AVAILABLE FROM	COMMENTS
Statistical Models:				
	HEC FFA 3.1 (February 1995)	U.S. Army Corps of Engineers	Water Resources Support Center[3] Corps of Engineers Hydrologic Engineering Center 609 Second Street Davis, CA 95616-4687	Performs flood frequency analyses following *Bulletin 17B, Guidelines for Determining Flood Flow Frequency*, prepared by the Interagency Advisory Committee on Water Data (1982). Supersedes HECWRC.
	PEAKFQ 2.4 (April 1998)	U.S. Geological Survey	U.S. Geological Survey Hydrologic Analysis Software Support Team 437 National Center Reston, VA 20192 http://water.usgs.gov/software/surface_water.html	Performs flood frequency analyses following *Bulletin 17B, Guidelines for Determining Flood Flow Frequency*, prepared by the Interagency Advisory Committee on Water Data (1982).
	FAN	FEMA	Michael Baker, Jr., Inc. 3601 Eisenhower Avenue, Suite 600 Alexandria, VA 22304	Determines depth and velocity zones over alluvial fans.
Hydraulic Models: Determination of Water-surface Elevations for Riverine Analysis				
One-dimensional Steady Flow Models	HEC-RAS 2.2 (September 1998)	U.S. Army Corps of Engineers	Water Resources Support Center Corps of Engineers Hydrologic Engineering Center (HEC) 609 Second Street Davis, CA 95616-4687 http://www.hec.usace.army.mil/	A HEC-2 file can be easily imported into HEC-RAS, however, the user must change the conveyance computations in HEC-RAS and make the necessary modifications to the bridge modeling before running HEC-RAS to duplicate the results obtained using HEC-2. The use of HEC-RAS for restudying a stream previously studied using HEC-2 is encouraged, as long as one of the following conditions is met: 1) the entire stream is rerun using HEC-RAS; or 2) the stream reach remodeled using HEC-RAS is hydraulically independent from the rest of the stream. The WSPRO bridge analysis is recommended for constricted floodplains under subcritical flow conditions.
	HEC-2 4.6.2[2] (May 1991)	U.S. Army Corps of Engineers	Water Resources Support Center[3] Corps of Engineers Hydrologic Engineering Center 609 Second Street Davis, CA 95616-4687	Includes culvert analysis and floodway options.
	WSPRO (June 1988 and up)	U.S. Geological Survey, Federal Highway Administration (FHWA)	Center for Microcomputers in Transportation (McTrans) University of Florida 512 Weil Hall Gainesville, FL 32611-6585	Floodway option is available in June 1998 version, user's manual is available on the FHWA web page at: http://www.fhwa.dot.gov/bridge
	WSP2 (October 1993)	U.S. Department of Agriculture, Natural Resources Conservation Service	U.S. Department of Commerce National Technical Information Service 5285 Port Royal Road Springfield, VA 22161	October 1993 version includes an encroachment option. Encroachment stations may be developed using FLDWY model (described below).

[2]The enhancement of these programs in editing and graphical presentation can be obtained from several private companies.
[3]Program is typically distributed by vendors and may not be available through HEC. A list of vendors may be obtained through HEC.

Numerical Models Accepted by FEMA for NFIP Usage

(shown in descending order of approximate usage within each type)

TYPE	PROGRAM	DEVELOPED BY	AVAILABLE FROM	COMMENTS
Hydraulic Models: Determination of Water-surface Elevations for Riverine Analysis (cont'd)				
One-dimensional Steady Flow Models (cont'd)	FLDWY (May 1989)	U.S. Department of Agriculture, Natural Resources Conservation Service	U.S. Department of Commerce National Technical Information Service 5285 Port Royal Road Springfield, VA 22161	Determines the encroachment stations from equal conveyance reduction method; used in conjunction with WSP2. Encroachment stations developed using this model must be re-entered in WSP2 model to properly develop floodway.
	E431/J635	U.S. Geological Survey	U.S. Geological Survey National Center 12201 Sunrise Valley Drive Reston, VA 22092	Cannot analyze culverts. Requires mainframe to run. Typically is converted to HEC-2 during revision.
	WSPG	Los Angeles County Flood Control District	Design Division Los Angeles County Dept. of Public Works 900 South Fremont Ave. Alhambra, CA 91803	Used in L.A. County and adjacent counties. Computes water-surface profiles and pressure gradients for open channels and closed conduits.
	QUICK-2 1.0 and up (January 1995)	FEMA	Federal Emergency Management Agency Hazard Identification Branch Mitigation Directorate 500 C Street, SW Washington, DC 20472	Intended for use in areas studied by approximate methods (Zone A) only. May be used to develop water-surface elevations at one cross section or a series of cross sections. May not be used to develop a floodway.
	HY8 4.1 and up (November 1992)	U.S. Department of Transportation, Federal Highway Administration (FHWA)	Center for Microcomputers in Transportation (McTrans) University of Florida 512 Weil Hall Gainesville, FL 32611-6585	Computes water-surface elevations for flow through multiple parallel culverts and over the road embankment. The FHWA web page is at: http://www.fhwa.dot.gov/bridge
One-dimensional Unsteady Flow Models	FEQ 8.92 and FEQUTL 4.68 (1997, both)	Delbert D. Franz, Linsley, Kraeger Associates; and Charles S. Melching, USGS	U.S. Geological Survey 221 North Broadway Avenue Urbana, IL 61801 http://water.usgs.gov/software/surface_water.html and technical support available at http://www-il.usgs.gov/proj/feq/	The FEQ model is a computer program for the solution of full, dynamic equations of motion for one-dimensional unsteady flow in open channels and control structures. The hydraulic characteristics for the floodplain (including the channel, overbanks, and all control structures affecting the movement of flow) are computed by its companion program FEQUTL and used by the FEQ program. Type 5 culvert flow computations of FEQUTL need verification with results obtained using methodology or models accepted for NFIP use. Floodway concept formulation is unavailable.
	Advanced ICPR 2.11 (August 1997)	Streamline Technologies, Inc.	Streamline Technologies, Inc. 7125 University Boulevard Winter Park, FL 32792	Previous versions of the model are not acceptable. Floodway concept formulation unavailable.
	DAMBRK	National Weather Service	Hydrologic Research Laboratory Office of Hydrology National Weather Service, NOAA 1345 East-West Highway Silver Spring, MD 20910	Calibration runs required to determine roughness coefficients. More review anticipated for flow through structures. Floodway concept formulation unavailable. The National Weather Service is no longer supporting the program; it should not be used for new studies.

Numerical Models Accepted by FEMA for NFIP Usage updated December 8, 1999

(shown in descending order of approximate usage within each type)

TYPE	PROGRAM	DEVELOPED BY	AVAILABLE FROM	COMMENTS
Hydraulic Models: Determination of Water-surface Elevations for Riverine Analysis (cont'd)				
One-dimensional Unsteady Flow Models (cont'd)	SWMM 4.30 (May 1994)	U.S. Environmental Protection Agency	Center for Exposure Assessment Modeling U.S. Environmental Protection Agency Office of Research and Development Environmental Research Laboratory 960 College Station Road Athens, GA 30605-2720 ftp://ftp.epa.gov/epa_ceam/wwwhtml/swmm.htm	Calibration or verification to the actual flood events highly recommended. Structural loss calculations unavailable and must be accommodated via roughness factor manipulation. Floodway concept formulation unavailable. Preferably, for NFIP purposes, head losses at bridges should be verified using WSPRO; losses at culverts should be verified using the U.S. Geological Survey's six equations for culvert analysis. Losses at storm sewer junctions should also be verified with separate calculations; contact FEMA for guidance with these calculations.
	NETWORK (DWOPER)	National Weather Service	Hydrologic Research Laboratory Office of Hydrology National Weather Service, NOAA 1345 East-West Highway Silver Spring, MD 20910	Less flexible than DAMBRK in specifying Mannings "n" values. Calibration to actual flood events required. Floodway concept formulation unavailable. The National Weather Service is no longer supporting the program; it should not be used for new studies.
	UNET 2.1 and up (May 1993)	U.S. Army Corps of Engineers	Water Resources Support Center Corps of Engineers Hydrologic Engineering Center (HEC) 609 Second Street Davis, CA 95616-4687	More than one version may be available. Only the HEC version will be accepted for NFIP purposes. Calibration or verification to the actual flood events highly recommended. Comparison of bridge and culvert modeling to other numerical models reveals significant differences in results; these differences may be investigated in the near future. Floodway option currently under review, not accepted for NFIP usage.
Two-dimensional Steady/Unsteady Flow Models	TABS	U.S. Army Corps of Engineers	Coastal Engineering Research Center Department of the Army Waterways Experiment Station Corps of Engineers 3909 Halls Ferry Road Vicksburg, MS 39180-6199	Limitations on split flows. Floodway concept formulation unavailable. More review anticipated for treatment of structures.
	FESWMS	U.S. Geological Survey	U.S. Geological Survey National Center 12201 Sunrise Valley Drive Reston, VA 22092	Region 10 has conducted study in Oregon. Floodway concept formulation unavailable.
	FLO-2D 99.1 (March 1999)	Jimmy S. O'Brien, Ph.D., P.E.	FLO Engineering, Inc. P.O. Box 66 Nutrioso, AZ 85932	Flood-routing model that has capabilities of modeling unconfined flows, complex channels, sediment transport, and mud and debris flow. It can be used for modeling alluvial fan flooding.
	DHM 21 (August 1987)	U.S. Geological Survey	Theodore V. Hromadka II, Ph.D., Ph.D., P.E., P.H. Department of Mathematics, Geology, and Environmental Studies California State University, Fullerton Fullerton, CA 92958-9020 thromadka@fail.com	Diffusion flow model which can route unconfined surface and open channel flows. Can be used to model alluvial flooding. Rainfall-runoff output can be used for hydrologic studies. Kinematic routing optional. Floodway concept formulation unavailable.
Floodway Analysis	SFD	U.S. Army Corps of Engineers/FEMA	Federal Emergency Management Agency Hazard Identification Branch Mitigation Directorate 500 C Street, SW Washington, DC 20472	Simplified floodway procedure for streams with no regulatory floodway limits.
	PSUPRO	Pennsylvania State University/ U.S. Army Corps of Engineers/FEMA	Federal Emergency Management Agency Hazard Identification Branch Mitigation Directorate 500 C Street, SW Washington, DC 20472	Encroachment analysis for streams with no regulatory floodway limits.

Santa Clara Valley
Water District

5750 ALMADEN EXPWY
SAN JOSE, CA 95118-3686
TELEPHONE (408) 265-2600
FACSIMILE (408) 266-0271
www.scvwd.dst.ca.us
AN EQUAL OPPORTUNITY EMPLOYER

June 9, 2000

Ms. Sheila M. Norlin
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304

Dear Ms. Norlin:

Subject: Thompson Creek Flood Control Project, Case No. 00-09-597P; Outfalls

In answering questions forwarded by Mr. Patrick Gervais of your company, we noted that a small portion of our LOMR application for Thompson Creek was based on an uncertified plan set for Outfall Improvements (Attachment C of the application). The certified, as-built set of plans were sent to you in May 2000. We have since revised portions of our application to reflect the certified, as-built conditions of the outfalls.

Enclosed please find three short segments of the application that should be substituted for the documents currently in your application binder:

1) MT-2 Form 8 Page 3 of 9

2) Supplemental answer for Section 5: Closures; Question 1

3) Attachment H: Table: Thompson Creek, Quimby Road to Westgrove Lane, Storm drains that penetrate the Levee System

Please remove the original sections from the application and replace them with the enclosed, updated information.

Thank you for this opportunity to improve our application. Please do not hesitate to phone me at (408) 265-2607 ext. 2432 if you have questions.

Sincerely,

Sara Duckler

Sara Duckler, P.E.
Assistant Civil Engineer
Flood Projects Unit

Enclosures

recycled paper

Sara Duckler

From: Sara Duckler
Sent: Friday, June 09, 2000 9:50 AM
To: 'pgervais@mbakercorp.com'
Cc: Dennis Cheong
Subject: Case No. 00-09-597P Thompson Ck. LOMR, San Jose CA

Patrick,

Here are answers to your questions on the interior drainage study for the Thompson Creek LOMR.

Regarding your question on the watershed area for drainage #4:

The area across the creek from Watershed #4 does not drain to Thompson Creek, and therefore was not included in the study. A field check confirmed that there are no outfalls into Thompson creek from this area.

Regarding your question concerning the number of outfalls and the installation of flapgates:

Our original application was based on the 1994 Outfall Improvement Plans (not the As-Builts). We have since corrected this, using the stamped As-Builts for the Outfall Improvements, which were sent to you in May. We will send via U.S. mail rewritten portions of the LOMR application that pertain to this subject.

There are five outfalls in the project area, draining the four watersheds as described in the Interior Drainage Study. Two outfalls drain Watershed #3. Four of the five outfalls are documented in the As-Built plan set for the 1994 Thompson Creek Outfalls Improvements by the City of San Jose. The fifth (at Scottsdale Ct.) was already equipped with a flapgate prior to the 1994 improvements, so does not appear on that set of improvement plans. The Scottsdale Ct. outfall is documented on the SCVWD 1980 and 1991 Map and Construction Plans for Thompson Creek (Attachments A and B of the application). We field-checked the location and existence of these five outfalls, and verified that manholes (with flapgates) had been installed in the outfall lines, according to the 1994 As-Builts for the Outfall Improvement Project.

Regarding your question concerning pressure conduits:

This term refers to the finding in the Interior Drainage Study that all storm drainage pipes would flow full (i.e. under pressure) during the 1% event.

Regarding your question on the last column in the output tables in the Interior Drainage Report:

We contacted Dave Wilson of Mark Thomas & Co.. The numbers in this column refer to the hydraulic grade line, specifically the calculated surcharge of the existing pipe, in feet. All the systems under study have some degree of surcharge during the 1% event (numbers in column all greater than 0). The % sign is most likely a result of old spreadsheet/output software, used to properly allign the columns of data and does not refer to actual percentages.

Again, we will be sending replacement sheets for the application sections that pertain to the number of outfalls within the project limits. I will mail them to Sheila Norlin of your company.

Please do not hesitate to call if you have further questions.

Sara Duckler
Assistant Civil Engineer
Santa Clara Valley Water District
(408) 265-2607 ext. 2432

TELEPHONE CONVERSATION

DATE June 1 2000 TIME _____ PHONE NO. (703) 960-8800 x 3005

PERSON CALLING/CALLED returning call from Patrick Gervais

AGENCY REPRESENTED Michael Baker / FEMA

CONVERSATION Re: Thompson Ck. Lomr Case No. 00-09-597P

- Interior Drainage Study (Apr 28 1994) across Channel from Washid #4 is area not included in study (~~inside~~ leveed area)

- Flap gates weren't installed ^ ~~for~~ but assumed to exist interior drainage study (Apr. 1994) - were they ever installed? Note: As-Builts for outfalls was Aug 1994 - check that correct ones were installed

- outfalls 7 listed in binder
  4 were studied

- Pressure conduits in study?

- in Hydraulic Analysis - output tables % in last column? what is that? is there surcharge on over 100%?

pgervais@mbakercorp.com

Santa Clara Valley Water District

FC 817 (01-27-92)

SRD
(Initials)

TELEPHONE CONVERSATION

DATE 5/25/00 TIME 945 PHONE NO. (703) 960-8800 x 3005

PERSON CALLING/CALLED Patrick Gervais

AGENCY REPRESENTED Baker Eng.

CONVERSATION He sent a letter on May 23rd (he mis dated it April 23 & is re sending one w/ May 23 date)

That letter acknowledged our May 9 letter, which transmitted information requested in his April 18th letter!

The concern is that, although this latest letter does not ask for additional information, it still has a 30-day response time limit & he therefore needed to have the correct date!

Santa Clara Valley Water District

FC 817 (01-27-92)

(Initials)

Federal Emergency Management Agency

Washington, D.C. 20472

Copy to • Randy Talley
• Central Files

May 23, 2000

Mr. Randall R. Talley, P.E.
Engineering Unit Manager
Flood Management Policy Planning Unit
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686

IN REPLY REFER TO:
Case No.: 00-09-597P
Community: City of San Jose, CA
Community No.: 060349

316-AD/ACK

Dear Mr. Talley:

This acknowledges receipt of additional data in support of, and authorization to proceed with our review of, your request for a Letter of Map Revision for the above-referenced community. Pertinent information about the request is listed below.

Identifier:	Thompson Creek Flood Control Project
Flooding Source:	Thompson Creek
FIRM Panel(s) Affected:	0027 D

Our review of the data submitted indicates we have the minimum data needed to continue our evaluation. If we need additional data to complete our evaluation, or if delays are encountered, we will notify you in writing within 30 days of the date of this letter.

If you write to us about your request, please include the case number shown above in your letter. If you have any questions about the status of your request, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627), or the Revisions Coordinator for your State, Ms. Sheila M. Norlin, who may be reached at (703) 317-3054.

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

cc: Mr. Michael Liu, P.E.
Floodplain Manager
Development Engineering Division

Federal Emergency Management Agency

Washington, D.C. 20472

April 23, 2000 incorrect date: 2nd letter was sent w/ May 23 as corrected date.

Mr. Randall R. Talley, P.E.
Engineering Unit Manager
Flood Management Policy Planning Unit
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686

IN REPLY REFER TO:
Case No.: 00-09-597P
Community: City of San Jose, CA
Community No.: 060349

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Identifier:	Thompson Creek Flood Control Project
Flooding Source:	Thompson Creek
FIRM Panel(s) Affected:	0027 D

Our review of the data submitted indicates we have the minimum data needed to continue our evaluation. If we need additional data to complete our evaluation, or if delays are encountered, we will notify you in writing within 30 days of the date of this letter.

If you write to us about your request, please include the case number shown above in your letter. If you have any questions about the status of your request, please call our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627), or the Revisions Coordinator for your State, Ms. Sheila M. Norlin, who may be reached at (703) 317-3054.

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

cc: Mr. Michael Liu, P.E.
Floodplain Manager
Development Engineering Division
City of San Jose

Santa Clara Valley
Water District

5750 ALMADEN EXPWY
SAN JOSE, CA 95118-3686
TELEPHONE (408) 265-2600
FACSIMILE (408) 266-0271
www.scvwd.dst.ca.us
AN EQUAL OPPORTUNITY EMPLOYER

May 9, 2000

Ms. Sheila M. Norlin
Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304

Dear Ms. Norlin:

Subject: Thompson Creek Flood Control Project, Case No. 00-09-597P

In response to the request for additional information from Mr. Yuan of the Federal Emergency Management Agency, enclosed please find a set of certified, as-built (record) drawings for the "Plans for the Construction of Thompson Creek Outfalls Improvements", prepared by the City of San Jose. This 3-page plan set replaces the original Attachment C of our LOMR application request dated March 30, 2000.

Thank you for the opportunity to respond to this request.

Sincerely,

Randall R. Talley, P.E.
Engineering Unit Manager
Flood Projects Unit

Enclosures

cc: Mr. Max H. Yuan, P.E., Project Engineer
Hazards Study Brancy
Mitigation Directorate
Federal Emergency Management Agency
Washington, D.C. 20472

Mr. Michael J. Liw
Floodplain Manager
Development Services Division
City of San Jose
801 North First, Room 308
San Jose, CA 95110-1789

recycled paper

CITY OF SAN JOSE
DEPARTMENT OF PUBLIC WORKS
801 NORTH FIRST STREET, ROOM 308
SAN JOSE, CALIFORNIA 95110
TELEPHONE (408) 277-5161

LETTER OF TRANSMITTAL

TO:

SCVWD
5750 Almaden Expressway
San Jose, CA 95118-3686

DATE	May 2, 2000
ATTENTION	Sara Duckler
RE	THOMPSON CREEK OUTFALL IMPROVEMENTS
	95-3592-36

WE ARE SENDING YOU: [X] Attached [ ] Under separate cover via the following items

- [ ] Shop drawings
- [ ] Prints
- [ ] Copy of letter
- [ ] Plans
- [ ] Specifications
- [ ] Change order
- [ ] Samples
- [ ] CPM Schedule
- [x] Other

COPIES	DATE	NO.	DESCRIPTION
1	5/2/00	3SH	COPY OF RECORD DRAWINGS (17"X24")
1	5/2/00	3SH	COPY OF RECORD DRAWINGS (11"X17")

THESE ARE TRANSMITTED as checked below:

- [ ] For approval
- [x] For your use
- [ ] As requested
- [ ] For review and comment
- [ ] FOR BIDS DUE
- [ ] Approved as submitted
- [ ] Approved as noted
- [ ] Returned for corrections
- [ ] See notations regarding public safety
- [ ] PRINTS RETURNED AFTER LOAN TO US
- [ ] Resubmit copies for approval
- [ ] Submit copies for distribution
- [ ] Return corrected prints

REMARKS Hope this helps with the LOMR.
Please review and comment. If you have any questions, please contact me at 277-5161.

Michael Liw, Floodplain Manager
Development Services

TELEPHONE CONVERSATION

DATE Monday May 1 2000 TIME 9:15 AM PHONE NO. (408) 277-5161

PERSON CALLING/CALLED Michael J. Ziw

AGENCY REPRESENTED CSJ Pub. Wks.

CONVERSATION Re: Plans for Thompson Ck. outfalls / LOMR

FEMA needs stamped / certified as-built plans.

left message

Santa Clara Valley Water District

FC 817 (01-27-92)

SRD

(Initials)

Federal Emergency Management Agency

Washington, D.C. 20472

April 18, 2000

Mr. Randall R. Talley, P.E.
Engineering Unit Manager
Flood Management Policy Planning Unit
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686

IN REPLY REFER TO:
Case No.: 00-09-597P
Community: City of San Jose, CA
Community No.: 060349

316-ACK.FRQ

Dear Mr. Talley:

This responds to your request dated March 30, 2000, that the Federal Emergency Management Agency (FEMA) issue a revision to the Flood Insurance Rate Map (FIRM) for the above-referenced community. Pertinent information about the request is listed below.

Identifier:	Thompson Creek Flood Control Project
Flooding Source:	Thompson Creek
FIRM Panel(s) Affected:	0027 D

We have completed an inventory of the items that you submitted. The items identified below are required before we can begin a detailed review of your request.

The submitted plans entitled "Plans for the Construction of Thompson Creek Outfalls Improvements," prepared by the City of San Jose Department of Public Works, dated March 19, 1994, are not certified by a registered professional engineer and are not stamped as-built. Please submit certified, as-built copies of these plans.

If all required items are not submitted within 90 days of the date of this letter, we will treat any subsequent request as an original submittal, and it will be subject to all submittal/payment procedures.

If you are unable to meet the 90-day deadline for submittal of required items, and would like FEMA to continue processing your request, you must request an extension of the deadline. This request must be submitted to our Mapping Coordination Contractor in writing and must provide (1) the reason why the data cannot be submitted within the requested timeframe, and (2) a new date for the submittal of the data. We receive a very large volume of requests and cannot maintain inactive requests for an indefinite period of time. Therefore, the fees will be forfeited for any request for which neither the requested data nor a written extension request is received within 90 days.

Please direct all required items and questions concerning your request to our Mapping Coordination Contractor at the following address:

Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, VA 22304

Attention: Ms. Sheila M. Norlin
Telephone: (703) 317-3054
Fax: (703) 960-9125

When you write us about your request, please include the case number referenced above in your letter.

If you have any questions concerning FEMA policy, or the National Flood Insurance Program in general, please contact the FEMA Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Max H. Yuan, P.E., Project Engineer
Hazards Study Branch
Mitigation Directorate

cc: Mr. Michael Liu, P.E.
Floodplain Manager
Development Engineering Division
City of San Jose

Need Information on FEMA FLOOD HAZARD MAPS?

CONTACT 1-877-FEMA MAP

(Toll Free 1-877-336-2627)

National Flood Insurance Program
Administered by FEMA

This release is intended to acquaint the public with the Federal Emergency Management Agency's new toll-free number established to respond to questions regarding National Flood Insurance Program (NFIP) Flood Hazard maps, including:

- How do I go about getting a Letter of Map Amendment (LOMA)? A Letter of Map Revision Based on Fill (LOMR-F)? A Letter of Map Revision (LOMR)?
- What is the status of my request for a LOMA? LOMR-F? Study?
- How long does it take to get the map revised?
- Did FEMA receive my request for a Letter of Map Amendment?
- I was just told by my lender that my house is in a floodplain and I need flood insurance, what are my options?
- Was a LOMA ever issued for my property?
- Has the National Flood Insurance Program Flood Hazard map for my community been revised?

The following procedures have been established by FEMA for changing and correcting the NFIP Flood Hazard maps. They are: Letters of Map Amendment (LOMAs), Letters of Map Revision(LOMRs), Letters of Map Revision Based on Fill (LOMR-Fs), and Physical Map Revisions.

As a result of numerous requests for revisions or corrections to the NFIP Flood Hazard maps, FEMA has assigned a dedicated staff of trained professionals to respond to the public's requests for information on the procedures to revise or correct the NFIP Flood Hazard maps.

If you have any questions regarding the NFIP Flood Hazard maps or need current information and facts on FEMA Mapping Procedures, call 1-877-FEMA-MAP.

Below are additional Toll-Free numbers that can be used to obtain other information regarding the NFIP and its products.

- For information about the NFIP's Preferred Risk Policy, ask your insurance agent or company, or call the NFIP's toll-free number at 1-800-427-9662.

- For any current FEMA publications, call FEMA's Publication Center at 1-800-480-2520.

- For answers to flood insurance related questions, call the National Flood Insurance Telephone Response Center at 1-800-427-4661.

- For ordering printed copies of effective NFIP Flood Hazard maps and related documents, call the FEMA Map Service Center at 1-800-358-9616.

Additional information on flood insurance and other FEMA programs and activities is available on the FEMA World Wide Web Site (http://www.FEMA.gov) and from FEMA's 24-hour-FAX-on-Demand system at (202) 646-FEMA. TDD# 1-800-427-5593.

Edition 1.0 2/25/99

Form 1
Revision Requestor and Community Official

FEDERAL EMERGENCY MANAGEMENT AGENCY

REVISION REQUESTER AND COMMUNITY OFFICIAL

O.M.B No. 3067-0148
Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.13 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

1. REQUESTED RESPONSE FROM FEMA

This request is for a:

☐ CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60,65 & 72).

☑ LOMR A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, floodway or flood elevations. LOMRs typically decrease flood hazards. (See 44 CFR Ch. 1 Parts 60 & 65.)

☐ Other Describe: _____

2. OVERVIEW

1. The basis for this revision request is (are): (check all that apply)

☑ Physical Change ☐ Improved Methodology/Data ☐ Floodway Revision

☐ Other Describe: _____

Note: A photograph is not required, but is very helpful during review.

2. Flooding Source: THOMPSON CREEK

3. Project Name/Identifier: THOMPSON CREEK FLOOD CONTROL PROJECT

4. FEMA zone designations affected: AO

(example: A, AH, AO, A1-A30, A99, AE, V, V1-V30, VE, B, C, D, X)

5. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	Katy, City	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
060349	SAN JOSE, CA CITY	CA	060349	0027D	08/02/82

6. The area of revision encompasses the following types of flooding and structures. Check all that apply.

Types of Flooding		Structures	
☒	Riverine	☒	Channelization
☐	Coastal	☒	Levee/Floodwall
☐	Alluvial fan	☐	Bridge/Culvert
☒	Shallow Flooding (e.g. Zones AO and AH)	☐	Dam
☐	Lakes	☐	Fill
☐	Other (describe)	☒	Other (describe) DROP STRUCTURE

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP? ☐ Yes ☐ No N/A
NO FLOODWAY FOR THOMPSON CK. SEE ATTACHMENT

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the ised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No ☒ N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☐ Yes ☒ No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

DISTRICT - SCVWD

The ~~community~~ is willing to assume responsibility for ☒ performing ☐ overseeing compliance with the maintenance and operation plans of the THOMPSON CREEK FLOOD CONTROL PROJECT flood
(Name)
control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

See Attachment 2 - District Act

Operation and maintenance plans are attached. ☒ **Yes** ☐ **No** ☐ **N/A** SEE ATTACHMENT F

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☒ Yes Fee amount: $ 4,700
OR
This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. ☐ Yes

ase see Instructions for Fee Amounts

7. SIGNATURE

Note: **I understand that my signature indicates that all information submitted in support of this request is correct**

Randy Talley
Signature of Revision Requester

Randy Talley - Eng Mgr
Printed Name and Title of Revision Requester

Santa Clara Valley Water Dist
Company Name

(408) 265-2607 x2611 3/30/2010
Telephone No. Date

Note: **Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.**

PLEASE SEE ATTACHED
Signature of Community Official

LETTER FROM MAYOR
Printed Name and Title of Community Official

OF SAN JOSÉ, CA
Community Name

- ATTACHMENT L -
Telephone No. Date

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

Sara Duckler
Signature

SARA DUCKLER - AST. CIVIL ENGR
Printed Name and Title of Revision Requester

Registr No. C58452 Expires (Date) 12/31/12 State CA

pe of License/Expertise: CIVIL ENGINEER

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ Hydrologic (3)	new or revised discharges
☒ Hydraulic (4)	new or revised water-surface elevations
☒ Mapping (5)	floodplain/floodway changes
☒ Channelization (6)	channel is modified
☐ Bridge/Culvert (7)	addition/revision of bridge/culvert
☒ Levee/Floodwall (8)	addition/revision of levee/floodwall
☐ Coastal (9)	new or revised coastal elevations
☐ Coastal Structures (10)	addition/revision of coastal structure
☐ Dam (11)	addition/revision of dam
☐ Alluvial Fan (12)	structures proposed on alluvial fan

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP? ☐ Yes ☐ No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No ☐ N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☐ Yes ☐ No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____ flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.
(Name)

Operation and maintenance plans are attached. ☐ **Yes** ☐ **No** ☐ **N/A**

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☐ Yes Fee amount: $_____

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. ☐ Yes

Please see Instructions for Fee Amounts

FOR LEVEE ANALYSIS

7. SIGNATURE

***Note:* I understand that my signature indicates that all information submitted in support of this request is correct**

Mohammad AKhan
Signature of Revision Requester

MOHAMMAD A. KHAN, ASSOC. C.E.
Printed Name and Title of Revision Requester

SANTA CLARA VALLEY WATER DIST
Company Name

(408) 265-2600 2/28/00
Telephone No. Date

***Note:* Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.**

_____
Signature of Community Official

_____
Printed Name and Title of Community Official

_____
Community Name

_____
Telephone No. Date

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

Mohammad AKhan
Signature

MOHAMMAD A. KHAN
ASSOC. Civil Engineer (Geotechnical)
Printed Name and Title of Revision Requester

Registr No. 45359 Expires (Date) 6/30/00 State CA

Type of License/Expertise: Civil (Expertise in Geotechnical)

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ **Hydrologic** (3)	new or revised discharges
☐ **Hydraulic** (4)	new or revised water surface elevations
☐ **Mapping** (5)	floodplain/floodway changes
☐ **Channelization** (6)	channel is modified
☐ **Bridge/Culvert** (7)	addition/revision of bridge/culvert
☐ **Levee/Floodwall** (8)	addition/revision of levee/floodwall
☐ **Coastal** (9)	new or revised coastal elevations
☐ **Coastal Structures** (10)	addition/revision of coastal structure
☐ **Dam** (11)	addition/revision of dam
☐ **Alluvial Fan** (12)	structures proposed on alluvial fan

4. ENCROACHMENT INFORMATION

-- the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP? ☐ Yes ☐ No

Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the vised floodway by the appropriate State agency.

Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No ☐ N/A

Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☐ Yes ☐ No

the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been et, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no surable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____ flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

(Name)

Operation and maintenance plans are attached. ☐ Yes ☐ No ☐ N/A

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☐ Yes Fee amount: $_____

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. ☐ Yes

Please see instructions for Fee Amounts FOR STRUCTURAL ANALYSIS OF FLOODWALL

7. SIGNATURE

Note: I understand that my signature indicates that all information submitted in support of this request is correct

_____
Signature of Revision Requester

_____
Printed Name and Title of Revision Requester

_____
Company Name

_____
Telephone No. Date

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.

_____
Signature of Community Official

_____
Printed Name and Title of Community Official

_____
Community Name

_____
Telephone No. Date

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sec. 65.3

Steph M. Faust
Signature

47275
EXP. 12-31-03

Printed Name and Title of Revision Requester

CIVIL
STATE OF CALIFORNIA

Lic. No. C47275 Expires (Date) 12/31/03 State CA

Type of License/Expertise: CIVIL ENGINEER

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ Hydrologic (3)	new or revised discharges
☐ Hydraulic (4)	new or revised water-surface elevations
☐ Mapping (5)	floodplain/floodway changes
☐ Channelization (6)	channel is modified
☐ Bridge/Culvert (7)	addition/revision of bridge/culvert
☐ Levee/Floodwall (8)	addition/revision of levee/floodwall
☐ Coastal (9)	new or revised coastal elevations
☐ Coastal Structures (10)	addition/revision of coastal structure
☐ Dam (11)	addition/revision of dam
☐ Alluvial Fan (12)	structures proposed on alluvial fan

Form 4
Riverine Hydraulic Analysis

FEDERAL EMERGENCY MANAGEMENT AGENCY RIVERINE HYDRAULIC ANALYSIS	O.M.B No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: CITY OF SAN JOSE, CA

Flooding Source: THOMPSON CREEK

Project Name/Identifier: THOMPSON CREEK FLOOD CONTROL PROJECT

1. REACH TO BE REVISED

Describe the limits of the revision OR submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☑ Yes

Downstream Limit: QUIMBY ROAD (INCLUDING RD.); STATION 6+60

Upstream Limit: IMMEDIATELY DOWNSTREAM OF CONFLUENCE WITH QUIMBY CK; STATION 60+85
APPX. WESTGROVE LANE

2. MODELS SUBMITTED

Requirements: for areas which have detailed flooding:	for areas which do not have detailed flooding:
Full input and output listings along with files on diskette for each of the models listed below (items 1-4) and a summary of the source of input parameters used in the models must be provided. The summary must include a description of any changes made from model to model (e.g., Duplicate Effective model to Corrected Effective model). At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.	Only the 100-year (Base) flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses (including all calculations) for existing or pre-project conditions and revised or post-project conditions must be submitted. *Please See Attachments M & N: diskette & printouts

1. Duplicate Effective Model ☑ Natural File Name THOMPRE.DAT ☐ Floodway File Name _____
Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models (10-, 50-, 100-, and 500-year multi-profile runs and the floodway run) must be obtained and then reproduced on the requester's equipment to produce the Duplicate Effective model. This is required to assure that the effective models input data has been transferred correctly to the requester's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model ☐ Natural File Name _____ ☐ Floodway File Name _____
The Corrected Effective model is the model that corrects any errors that occur in the Duplicate Effective model, adds any additional cross sections to the Duplicate Effective model, or incorporates more detailed topographic information than that used in the currently effective model. The Correctly Effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model ☐ Natural File Name _____ ☐ Floodway File Name _____
The Duplicate Effective model or Corrective Effective model is modified to produce the Existing or Pre-Project Conditions model to reflect any modifications that have occurred within the floodplain since the date of the Effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the Corrected Effective model or Duplicate Effective model.

4. Revised or Post-Project Conditions Model ☑ Natural File Name THOMPOST.DAT ☐ Floodway File Name _____
The Existing or Pre-Project Conditions model (or Duplicate Effective model or Corrected Effective model, as appropriate) is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for the proposed project this model must reflect proposed conditions.

5. Other - Please attach a sheet describing all other models submitted along with the file names. ☐ Natural ☐ Floodway

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

3. STARTING WATER-SURFACE ELEVATIONS

Explain how they were determined. FROM FIA MODEL IMMEDIATELY DOWNSTREAM AND CONTIGUOUS WITH MODEL. Explanation Attached? ☑ Yes ☐ No

NOTE: If the effective study is an approximate study, the slope/area method is recommended. For detailed analysis studies, using a known water-surface elevation is recommended.

4. RESULTS (from the model used to revise the 100-year water surface elevations)

If the results indicate any of the following, attach an explanation - to this form, or to the hydraulic model printout- as to the reasonableness of the situation.

☐ Supercritical depth ☑ Critical Depth ☐ Drawdowns ☐ Negative Floodway Surcharges

☐ Floodway Surcharges Greater Than Maximum Allowed by Community/State

☐ Water surface elevations higher than the end points of cross sections.

☐ Floodway discharge is different than the Natural 100-year (base) flood discharge.

☐ Project causes 100-year floodplain or floodway elevations to increase (state if increases are located off the requester's property)

Explanation attached with Form ☑ **Explanation provided on attached printout** ☐

If Hydraulic model used is HEC-2, has it been checked with FEMA'S CHECK-2 computer program? ☐ **Yes** ☑ **No**
(see instructions for information on how to obtain CHECK-2)

5. REVISED FIRM/FBFM AND FLOOD PROFILES

1. Profile Transition

a. 100-Year Water-Surface Elevations - indicate the difference in water surface elevations where the project 100-year elevations tie into the existing 100-year water surface elevations at each end of the project.

Downstream End 302+62 (Cross-Section #) within 0.01 (feet) — Stationing from FEMA's Silver Ck. Run, d/s and contiguous with FEMA Thompson Ck. Run

Upstream End 70+41 (Cross-Section #) within 0.01 (feet) — Thompson Ck. Stationing, Consistent with FEMA's Thompson Ck. Study

b. Floodway Elevations - indicate the difference in water surface elevations where the project floodway elevations tie into the existing floodway water surface elevations at each end of the project.

Downstream End N/A (Cross-Section #) within _____ (feet)

Upstream End N/A (Cross-Section #) within _____ (feet)

NO FLOODWAY DESIGNATED FOR THOMPSON CK. See Attachment G.

c. Floodway widths - indicate the difference in floodway widths where the project floodway widths tie into the existing floodway width at each end of the project.

Downstream End N/A (Cross-Section #) within _____ (feet)

Upstream End N/A (Cross-Section #) within _____ (feet)

2. Profile Checklist (check box if information has been provided on profile)

SEE ATTACHMENT K.

The following information (unless in parentheses) must be included at the same scale as the existing profiles for this project:

☑ Stream Name ☑ Community Name ☑ Corporate Limits labeled ☑ Study limits labeled

☑ Confluences labeled ☑ Channel Stationing ☑ Streambed profiled ☑ Cross Sections labeled

☑ Horizontal/Vertical Scales indicated ☑ 100-year elevs profiled*

☑ Road Crossings ☑ Labeled ☑ Low Chord Elevations ☑ Top of Road Elevations

*All recurrence intervals in the effective study must also be profiled.

Floodway Data Table

Attach a Floodway Data Table for each cross section listed in the published Floodway Data table in the FIS report.

Floodway Data Table Attached ☐ **Yes** ☑ **Not Required** N/A

SUPPLEMENTAL RESPONSES
LETTER OF MAP REVISION
FORM 4 - RIVERINE HYDRAULIC ANALYSIS

THOMPSON CREEK, SAN JOSE, CALIFORNIA

SECTION 3: STARTING WATER-SURFACE ELEVATIONS

The Post-Project conditions model (THOMPOST) includes five sections identically duplicated from the FIS Lower Silver Creek model (immediately downstream of and contiguous with Thompson Creek), in order to capture a rapidly changing Q, as modeled in the FIS Duplicate Effective Model (THOMPRE). The starting water surface elevation was selected to match the water surface elevation calculated in the existing FIS model for the downstream most section used. This assured that the downstream water surface elevations matched *exactly* between the Duplicate Effective Model and the Post-Project conditions model.

The Duplicate Effective Model used a different Q for each of the first four cross-sections. The Post-Project Model was extended downstream to include all of these flow rates downstream of the actual project location. The Post-Project Model used the same downstream flow rates as the Duplicate Effective Model, but held the Q at 3000 cfs for the length of the project area, as compared to 1900 cfs in the Duplicate Effective Model, to account for full containment of the 1% flow. The following Table shows the flow rates used for each of the models.

Station	**Duplicate Effective Model 1% Q (cfs)**	**Post-Project Model 1% Q (cfs)**
302+62	2000	2000
309+47	3300	3300
314+47	3600	3600
Start Thompson Creek Stationing------		
2+71	1900	3000

SECTION 4: RESULTS

Critical Depth

The post-project model reports possible critical depths at six locations in the model, within the project area. For comparison, the pre-project (duplicate effective) model reports critical depth at eleven cross-sections within the submitted run. Three of the post-project model critical depth sections occur at drop structures near the Quimby Road bridge. It is assumed that the water will pass through critical depth at drop structures. However, no hydraulic jumps are anticipated, because the flow is deep and subcritical immediately downstream of each drop structure.

The channel slope is near-critical for much of the project length upstream of the drop structure. The remainder of the critical section warnings occur at rapid transitions in channel cross-sectional area within this steeper-slope reach. The combination of near-critical slope and cross-sectional area transitions produces a critical-depth warning in the HEC-2 model. The locations of possible critical depth *within the project reach* and their respective explanations are provided in the table below:

Station	**Location in Project**	**Explanation**
9+19	downstream of Quimby Road bridge; also downstream of project.	Drop structure located downstream of Quimby Road bridge.
11+06	Upstream of Quimby Road bridge; concrete drop structure	Drop structure located upstream of Quimby Road bridge.
11+34	Upstream of Quimby Road bridge; concrete weir	Weir and drop structure upstream of Quimby Road bridge
21+89	In transition area, where channel broadens to modified floodplain, with levees set back from low flow channel.	First section of change in channel cross-sectional area, where 1% flow is not contained entirely within channel, but there is shallow flow on floodplain between levees. Wetted perimeter increases substantially.
37+00	Just upstream of a transition to "one-sided" floodplain, where southern bank setback levee transitions to be adjacent to low-flow channel.	First section of next major change in channel cross-sectional area, with half of the floodplain removed from conveyance area. Decrease in wetted perimeter.
56+00	Upstream end of modified floodplain; upstream end of flood protection project.	Flow is fully contained within "low-flow"channel; floodplain is not used by 1% flow, therefore, wetted perimeter is substantially reduced at this cross-section.

Form 5
Mapping

FEDERAL EMERGENCY MANAGEMENT AGENCY RIVERINE/COASTAL MAPPING	O.M.B No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Note: Fill out one form for each flooding source studied

Community Name: SAN JOSE, CA CITY

Flooding Source: THOMPSON CREEK

Project Name/Identifier: THOMPSON CREEK FLOOD CONTROL PROJECT

This is a ☑ Manual ☐ Digital submission. *Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance as possible.*

1. MAPPING CHANGES

1. A topographic workmap must be submitted showing the following information (check N/A when not applicable):

*Please See Supplemental Responses for Form 5, Attached

a. Revised approximate 100-year floodplain boundaries (Zone A)	☒ Yes	☐ No	☐ N/A
b. Revised detailed 100- and 500-year floodplain boundaries.	☒ Yes	☐ No	☐ N/A
c. Revised floodway boundaries	☐ Yes	☐ No	☒ N/A
d. Location and alignment of all cross sections with stationing control indicated.	☒ Yes	☐ No	☐ N/A
e. Stream alignments, road alignments and dam alignments.	☒ Yes	☐ No	☐ N/A
f. Current community boundaries.	☒ Yes	☐ No	☐ N/A
g. Effective 100-year floodplain and floodway boundaries from FIRM/FBFM reduced or enlarged to the scale of the topographic workmap	☒ Yes	☐ No	☐ N/A
h. Tie-ins between the effective and revised 100-, 500-year and floodway boundaries	☐ Yes	☐ No	☒ N/A
i. The requester's property boundaries and community easements	☒ Yes	☐ No	☐ N/A
j. The signed certification of a registered professional engineer	☒ Yes	☐ No	☐ N/A
k. Location and description of reference marks	☒ Yes	☐ No	☐ N/A
l. Vertical datum (example: NGVD, NAVD)	☒ Yes	☐ No	☐ N/A
m. Coastal zone designations tie into adjacent areas not being revised	☐ Yes	☐ No	☒ N/A
n. Location and alignment of all coastal transects used to revise the coastal analyze	☐ Yes	☐ No	☒ N/A
o. V-zone has been delineated to extend landward to the heel of the primary frontal dune	☐ Yes	☐ No	☒ N/A

If any items are marked No or N/A please attach an explanation.

2. What is the source and date of the updated topographic information (example: orthophoto maps, July 1985; filed survey, May 1979, beach profile, June 1987 etc.)? (A) As-Built Map & Construction Plan for Thompson Ck., Lower Silver Ck, and Quimby Ck. SCVWD Nov. 1980 (B) As-Built Map & Construction Plan for Thompson Ck. from Quimby Rd. to Westgrove Lane SCVWD March 1991

3. What is the scale and contour interval of the following workmaps?

Effective FIS — Scale 1:1,200 — Contour Interval 2 feet (Ref. # 27 of 1986 FIS for City of San Jose)

Revision Request — Scale 1:50 — Contour Interval N/A - Construction Plans & Profiles, Showing flow is FULLY CONTAINED - No Topo Map Neces.

NOTE: Revised topographic information must be of equal or greater detail than effective.

4. Attach an annotated FIRM/FBFM at the scale of the effective FIRM/FBFM showing the revised 100- and 500-year floodplain and the floodway boundaries and how they tie into those shown on the effective FIRM/FBFM downstream and upstream of the revisions or adjacent to the area of revision for coastal studies. **FIRM/FBFM attached?** ☒ **Yes** ☐ **No**

SEE ATTACHMENT J

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. EARTH FILL PLACEMENT

1. The fill is: ☒ Existing ☐ Proposed

2. Has fill been/will be placed in the regulatory floodway? ☐ Yes ☒ No
   If Yes, please attach completed Riverine Hydraulic Analysis Form (Form 4).

3. Has fill been/will be placed in floodway fringe (*area between the floodway and 100-year floodplain boundaries*)? ☐ Yes ☒ No

   If Yes, then complete A, B, C, and D below.

   a. Are fill slopes for granular materials steeper than one vertical on one-and-one-half horizontal? ☐ Yes ☐ No

      If Yes, justify steeper slopes _____

      _____

   b. Is adequate erosion protection provided for fill slopes exposed to moving flood waters? (*Slopes exposed to flows with velocities of up to 5 feet per second (fps) during the 100-year flood must, at a minimum, be protected by a cover of grass, vines, weeds, or similar vegetation; slopes exposed to flows with velocities greater than 5 fps during the 100-year flood must, at a minimum, be protected by stone or rock riprap.)*

      ☐ Yes ☐ No

      If No, describe erosion protection provided _____

      _____

   c. Has all fill placed in revised 100-year floodplain been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test Method or acceptable equivalent method? ☐ Yes ☐ No

   d. Can structures conceivably be constructed on the fill at any time in the future? ☐ Yes ☐ No

   If Yes, attach certification of fill compaction (item 3c. above) by the community's NFIP permit official, a registered professional Engineer, or an accredited soils engineer in accordance with Subparagraph 65.5(a)(6) of the NFIP regulations.

   Fill certification attached ☐ **Yes** ☐ **No**

4. Has fill been/will be placed in a V zone? ☐ Yes ☒ No

   If Yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall?

   ☐ Yes ☐ No

   If Yes, attach the Coastal Structures Form (Form 10).

SUPPLEMENTAL RESPONSES
LETTER OF MAP REVISION
FORM 5 - RIVERINE/COSTAL MAPPING

THOMPSON CREEK, SAN JOSE, CALIFORNIA

SECTION 1: MAPPING CHANGES, QUESTION 1

a. Revised approximate floodplain boundaries.

Detailed 100-year floodplain boundaries are shown on the FIRM, Attachment J. Within the project area, all flows are contained within the creek banks, Zone A. The entire Zone AO floodplain at Scottsdale Drive has been removed from the floodplain.

b. Revised detailed 100- and 500-year floodplain boundaries.

Detailed 100-year floodplain boundaries are shown on the FIRM, Attachment J. Within the project area, all flows are contained within the creek banks, Zone A. The entire Zone AO floodplain at Scottsdale Drive has been removed from the floodplain.

Since the 500-year floodplain boundaries are not addressed in the FIRM or the FIS, they are not addressed in this LOMR.

c. Revised flood way boundaries

Not applicable. There is no defined floodway for Thompson Creek. See Attachment G.

d. Location and alignment of all cross sections with stationing control indicated.

See 1991 construction plans, Attachment B .

e. Stream alignments, road alignments and dam alignments.

Stream and road alignments are shown in the 1980 and 1991 construction plans. See Attachments A and B. This project contains no dams.

f. Current community boundaries.

The project is located within the City of San Jose. Please see sheets 1 and 2 of 1991 construction plans, Attachment B.

g. Effective 100-year floodplain and floodway boundaries from FIRM/FBFM

reduced or enlarged to the scale of the topographic workmap.

The effective revised 100-year floodplain within the project area (Quimby Road to Westgrove Lane) corresponds to Zone A as shown on the FIRMs (see Attachment J). All flows are now contained within the channel. The entire area of Zone AO flooding along Scottsdale Dr. has been removed from the floodplain.

There are no floodways on Thompson Creek.

h. Tie-ins between the effective and revised 100-, 500-year and flood way boundaries

Not applicable. There are no floodways along Thompson Creek.
See Attachment G.

i. The requester's property boundaries and community easements

Property boundaries and easements are shown on the 1991 Construction Plans. Please see Attachment B.

j. The signed certification of a registered professional engineer

All plans are signed as appropriate.

k. Location and description of reference marks

All plans submitted contain a legend.

l. Vertical datum (example: NGVD, NAVD)

The datum for the 1980 and 1991 Construction Plans is NGVD. See Attachments A and B.

m. Costal zone designations tie into adjacent areas not being revised

Not applicable. The project is not in a costal zone.

n. Location and alignment of all coastal transects used to revise the costal analyze

Not applicable. The project is not in a costal zone.

o. V-zone has been delineated to extend landward to the heel of the primary frontal dune.

Not applicable. The project is not in a coastal zone.

Form 6
Channelization

FEDERAL EMERGENCY MANAGEMENT AGENCY **CHANNELIZATION**	O.M.B. Burden No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

lic reporting burden for this form is estimated to average 1.75 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: SAN JOSE, CA

Flooding Source: THOMPSON CREEK

Project Name/Identifier: THOMPSON CREEK FLOOD CONTROL PROJECT

1. REACH TO BE REVISED

Describe the limits of the revision **OR** submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes

Downstream Limit: QUIMBY RD.

Upstream Limit: IMMEDIATELY DOWNSTREAM OF CONFLUENCE WITH QUIMBY CREEK ~AT WEST GROVE LANE

2. CHANNEL DESCRIPTION

Attach the following information about the channel (check box if information has been provided):
Please see Attached Supplemental Responses for Form 6, Attached

☒ Description of the inlet and outlet

☒ Description of the shape of the channel *(both cross sectional and planimetric configuration)* and its lining *(channel bottom and sides)*:

3. ACCESSORY STRUCTURES

The channelization includes:

☒ Levees *(Attach Levee/Floodwall System Analysis Form - Form 8)*
☒ Drop structures
☐ Superelevated sections
☒ Transitions in cross sectional geometry
☐ Debris basin/detention basin
☐ Energy dissipater
☐ Other (Describe):

4. DRAWING CHECKLIST

Attach the plans of the channelization certified by a registered professional engineer. The plan detail and information should include (check box if information has been provided):

☒ Channel alignment and locations of inlet, outlet, and accessory structures

☒ Channel lining

☒ Typical cross sections and profiles of channel banks and invert

ATTACHMENTS A and B ARE ENGINEERING DRAWINGS OF THE CHANNEL.

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

5. HYDRAULIC CONSIDERATIONS

1. The channel was designed to carry _____ (cfs) and/or the 100 -year flood.

2. The design elevation in the channel based on:

   ☒ Subcritical flow

   ☐ Critical flow

   ☐ Supercritical flow

   ☐ Energy grade line

3. **If there is the potential for a hydraulic jump at the following locations, check the box(es) that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.**

Inlet to channel?	☐ Yes	☒ No
Outlet of channel?	☐ Yes	☒ No
At Drop Structures?	☐ Yes	☒ No – Potential jump is submerged by deep subcritical flow downstream of the drops.
At Transitions?	☐ Yes	☒ No
Other locations?	☐ Yes	☒ No

Explanation Attached? ☐ Yes ☐ No ☒ N/A

6. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year (base flood) water-surface elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including sewer and deposition) to affect the base flood water-surface elevations, then provide the following information **(Check the box if provided):**

☐ Estimated sediment load

☐ Method used to estimate sediment transport

☒ Method used to estimate scour and/or deposition

☒ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport/deposition

THOMSED.DAT is included with attached data diskette - Attachment M
Printout is Attachment N

*Please See Attached Supplemental Responses for Form 6

SUPPLEMENTAL RESPONSES
LETTER OF MAP REVISION
FORM 6 - CHANNELIZATION

THOMPSON CREEK, SAN JOSE, CALIFORNIA

SECTION 2: CHANNEL DESCRIPTION

Descriptions of the channel are provided below. Please see also the Map and Construction Plan for Thompson Creek from Quimby Road to Westgrove Lane, March, 1991 (Attachment B).

Description of the Channel Inlet and Outlet

The inlet is the natural, unmodified creek channel upstream of the project reach. There is a smooth transition to the project area. The outlet is the wide earth channel on lower Silver Creek. There is a smooth transition to the downstream channel as well.

Description of the Shape of the Channel: See Attachments A and B (Maps and Construction Plans) for full planimetric and profile views of the channel.

Quimby Road Bridge to Modified Floodplain (District Sta. 10+61 to 21+89)

In this reach, the channel is an excavated trapezoidal earth channel with levees on both sides. There is a low flow channel within the main leveed channel. The banks of the low flow channel and the banks of the levees are protected with rock lining. Maintenance roads are located on the top of the levees. The average channel width (from centerline of levee to centerline of levee) is approximately 150 feet. The average channel depth (from invert to top of levee) is approximately 9 feet. At District Sta.21+89 the channel transitions into a wide, modified flood plain.

Modified Floodplain to Westgrove Lane (District Sta. 21+89 to Sta. 53+05)

In this reach, the channel is a modified flood plain, with setback levees on both sides of the floodplain. There is a low flow channel within the leveed channel. The entire channel is earthen, with vegetation on the flood plain. Maintenance roads are located on the top of the levees in most areas. The channel width (from centerline of levee to centerline of levee) varies from approximately 200 feet to 320 feet. The channel depth (from invert to top of levee) varies from approximately 8 feet to 17 feet.

SECTION 6: SEDIMENT TRANSPORT CONSIDERATIONS

According to maintenance records, sediment deposition occurs on Thompson Creek in the reach downstream of the Quimby Road drop structure, to the confluence with Lower Silver Creek. Sediment deposition also occurs within the box culvert under Quimby Road.

Maintenance Program Guidelines for Thompson Creek (Attachment F) require that sediment be removed from the drop structure and culvert areas when the depth of uniform sediment deposition reaches 1 foot, or when the depth of localized sediment deposition (sediment bars) reaches 2 feet. For other areas of the improved channel, upstream of the Quimby Road drop structure, the Maintenance Guidelines allow for a uniform sediment deposition of 2 feet, or localized sediment deposition (sediment bars) of up to 4 feet. However, the areas upstream of the drop structure do not experience significant sediment deposition.

To investigate the effects of sediment on the project flood conveyance capacity, the post-project model (THOMPOST.DAT) was modified to incorporate two feet of sediment deposition in the reach between Lower Silver Creek (start of run) and the drop structure immediately upstream of Quimby Road (Station 11+05), using the X3 variable ELSED. The model demonstrates that FEMA freeboard requirements will be met even for the condition of maximum allowable sedimentation for 1% and 10% flows.

The model used to investigate sedimentation, THOMSED.DAT is included with this application.

Form 8
Levee/Floodwall System Analysis

FEDERAL EMERGENCY MANAGEMENT AGENCY LEVEE/FLOODWALL SYSTEM ANALYSES	O.M.B. Burden No. 3067-0148 Expires April 30, 2001

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.0 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: SAN JOSE, CA

Flooding Source: THOMPSON CREEK

Project Name/Identifier: THOMPSON CREEK FLOOD CONTROL PROJECT

1. REACH TO BE REVISED

Describe the limits of the revision **OR** submit a copy of the FIRM with the revision area clearly highlighted.
Copy of FIRM(s) attached depicting area of the revision (highlighted, or circled)? ☒ Yes SEE ATTACHMENT J

Downstream Limit: QUIMBY ROAD

Upstream Limit: D/S OF QUIMBY CREEK @ WESTGROVE LANE

2. LEVEE/FLOODWALL SYSTEM ELEMENTS

1. This Levee/Floodwall analysis is based on:

☒ upgrading of an existing levee/floodwall system
☐ a newly constructed levee/floodwall system
☐ reanalysis of an existing levee/floodwall system

2. Levee elements and locations are:

	WEST BANK	EAST BANK
☒ earthen embankment, dike, berm, etc.	Station 10+00 to 50+50	10+00 to 53+50
☒ structural floodwall	Station 42+65 to 43+93.12	– NONE THIS SIDE –
☐ other (describe): _____	Station _____ to _____	

3. Structural Type: SEE ATTACHMENT B: Constr. Plans 1991 Sheets 4-7 and 16

☒ monolithic cast-in place reinforced concrete – See Sheet 17 of ATTACHMENT B
☐ reinforced concrete masonry block
☐ sheet piling
☐ other (describe): _____

4. Has this levee/floodwall system been certified by a Federal agency to provide protection against the 1% annual chance (100-year) Flood event? ☐ Yes ☒ No

If Yes, by which agency? _____

If Yes, complete only the interior drainage section on pages 7 and 8 of this form and the operation and Maintenance section of Revision Requestor and Community Official Form.

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

2. LEVEE/FLOODWALL SYSTEM ELEMENTS (Cont'd)

5. Attach certified drawings containing the following information (indicate drawing sheet numbers):

a. Plan of the levee embankment and floodwall structures. Sheet Numbers 2, 4-7 Attachment B

b. A profile of the levee/floodwall system showing the 100-year water-surface (base flood) elevation, levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers 4-7, 8, 9 Attachment B

c. A profile of the base flood elevation, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure device. Sheet Numbers 4-9 Attachment B

d. A layout detail for the embankment protection measures. Sheet Numbers Section 5.5, Attachment E

X See Attachment E- Geotechnical Report and Attached Operation + Maintenance Plan, Attachment F

e. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers 10-17; SD-1; L-1; L-2; C-1 through C-16 Attachment B

3. FREEBOARD

1. The minimum freeboard provided above the base flood elevation is:

Riverine

3.0 feet or more at the downstream end and throughout	☑ Yes	☐ No
3.5 feet or more at the upstream end	☑ Yes	☐ No
4.0 feet immediately upstream of all structures and constrictions	☑ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave for the 100-year stillwater surge elevation or maximum wave runup (whichever is greater). N/A	☐ Yes	☐ No
..0 feet above 100-year stillwater surge elevation NOT COASTAL	☐ Yes	☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation Addressing Part 65.10(b)(1)(ii) of the National Flood Insurance Program regulations.

If No is answered to any of the above, please attach an explanation.

2. Is there an indication from historical records that ice-jamming can effect the base flood elevation? ☐ Yes ☒ No
If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Tabulate the elevations at critical locations (tabulate values at each levee crest grade change, and where sediment may accumulate such as along bends in the channel.)

Station	Location	100-year Water Surface Elevation	Levee Crest	Freeboard (ft.)
	Upper end			
— PLEASE SEE ATTACHED SUPPLEMENTAL RESPONSES —				
	FOR FORM 8			
	Lower end			

(E .d table on an added sheet as needed and reference)

4. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year water-surface (base flood) elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there a potential for debris and sediment transport (including sewer and deposition) to affect the base flood elevations, then provide the following information:

- ☐ Estimated sediment load
- ☐ Method used to estimate sediment transport
- ☒ Method used to estimate scour and/or deposition — SEE SUPPLEMENTAL RESPONSES FOR FORM 8, ATTACHED
- ☒ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport

5. CLOSURES

1. Openings through the levee system:

☒ exist ☐ do not exist

VOID Sent updates Michael Baker 6/9/00 - See Next sheet

If openings exist, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device
34+05	LEFT	STORM DRAIN	156.0	FLAP GATE
38+00	RIGHT	STORM DRAIN	158.7	FLAP GATE
38+10	RIGHT	STORM DRAIN	161.0	FLAP GATE
43+90	RIGHT	STORM DRAIN	166.7	FLAP GATE
44+10	LEFT	STORM DRAIN	161.7	FLAP GATE
44+25	LEFT	STORM DRAIN	166.5	FLAP GATE
57+38	LEFT	STORM DRAIN	175.6	FLAP GATE

(Extend table on an added sheet as needed and reference)

PLEASE SEE SUPPLEMENTAL RESPONSES FOR FORM 8, ATTACHED

Note:
Geotechnical and geologic data

In addition to the required detail analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following levee system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers EM-1110-2-1906 Form 2086).

4. SEDIMENT TRANSPORT CONSIDERATIONS

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the 100-year water-surface (base flood) elevations; and/or based on the stream geomorphology, vegetative cover, development of the watershed and bank conditions, there potential for debris and sediment transport (including sewer and deposition) to affect the base flood elevations, then provide the following mation:

- ☐ Estimated sediment load
- ☐ Method used to estimate sediment transport
- ☒ Method used to estimate scour and/or deposition — See supplemental responses for form 8, attached.
- ☒ Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport

5. CLOSURES

1. Openings through the levee system:

☒ exist ☐ do not exist

If openings exist, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device
34+05	Left	Storm Drain	156.0	FLAP GATE
38+00	Right	Storm Drain	158.7	FLAP GATE
44+35	Right	Storm Drain	166.7	FLAP GATE
44+10	Left	Storm Drain	161.7	FLAP GATE
56+70	Left	Storm Drain	175.6	FLAP GATE

(Extend table on an added sheet as needed and reference)
Please see supplemental Responses for form 8, attached.

Note:
Geotechnical and geologic data

In addition to the required detail analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following levee system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers EM-1110-2-1906 Form 2086).

This corrected update was sent to Michael Baker Jr. 6/19/00

6. EMBANKMENT PROTECTION

1. The maximum levee slope landside is: 2:1

   The maximum levee slope floodside is: 2:1

3. The range of 100-year (base) riverine flood velocities along the levee? 3.8 fps (min.) to 8.4 fps (max.)

4. Embankment material is protected by (describe the kind): Partial Vegetation, Levee Operation & Maint. Plan (Attachment F) Specifies that minor erosion cracks will be monitored and repaired as needed to protect the levees and creek bank.

5. Riprap Design Parameters: (Include references) ☐ Velocity ☐ Tractive stress

Reach		Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
						D_{100}	D_{50}	Thickness	
Sta	to								
Sta	to								
Sta	to								
Sta	to								
Sta	to								
Sta	to								

(Extend table on an added sheet as needed and reference)

6. Is a bedding/filter analysis and design attached? ☐ Yes ☒ No

7. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

See Section 5.5 of Geotechnical Report (Attachment E) and O+M Plan (Attachment F)

Note: Attach engineering analysis to support construction plans.

7. EMBANKMENT AND FOUNDATION STABILITY - WEST LEVEE

Identify locations and describe the basis for selection of critical location for analysis: See Attachment E · Geotechnical Report Sections 2.1 & 5.1.2. Location Selected based on geometry & levee/foundation soil properties.

☐ Overall height: Sta TCR 19+00, height 10 ft.

☐ Limiting foundation soil strength:

Sta TCR 19+00, depth 10 to 40 ft. See Attachment E

Strength Ø = 20 degrees, c = 100 psf

slope: SS = 2 (h) to 1 (v)

(Repeat as needed on an added sheet for additional locations)

. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.): Circular Arc, used PC STABL 5M, Bishop's Modified Method

. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	2.7	1.3
II	Sudden drawdown	1.0 *	1.0
III	Critical flood stage	1.5	1.4
IV	Steady seepage at flood stage	1.4 *	1.4
VI	Earthquake (Case I) ⁽⁹⁾	1.0 *	1.0

Reference: U.S. Army Corps of Engineers (USACE) EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☐ Yes ☒ No

If Yes, describe methodology used: SEE SECTION 5.3, Attachment E, Geotechnical Report

5. Was a seepage analysis for the foundation performed: ☐ Yes ☒ No

6. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☒ No

7. Were seepage exit gradients checked for piping potential? ☐ Yes ☒ No

8. The duration of 100-year (base) flood hydrograph against the embankment is 2 hours.

Note: **Attach engineering analysis to support construction plans.**

* These marginal FS values are based on conservative strength parameters. See Geotechnical Report; Attachment E

7. EMBANKMENT AND FOUNDATION STABILITY EAST LEVEE

1. Identify locations and describe the basis for selection of critical location for analysis: See Attachment E- Geotechnical Report sections 2.1 & 5.1.2 Location selected based on geometry + levee/foundation soil properties

☐ Overall height: Sta TCL 35+00, height 7 ft.

☐ Limiting foundation soil strength:

Sta TCL 35+00, depth 7 to 35

Strength Ø = 20 degrees, c = 100 psf

slope: SS = 2 (h) to 1 (v)

(Repeat as needed on an added sheet for additional locations)

2. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.): Circular arc, used PCSTABL5M, Bishop's Modified Method

3. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction	3.8	1.3
II	Sudden drawdown	1.2	1.0
III	Critical flood stage	1.7	1.4
IV	Steady seepage at flood stage	1.7	1.4
VI	Earthquake (Case I)	1.2	1.0

(Reference: U.S. Army Corps of Engineers (USACE) EM-1110-2-1913 Table 6-1)

4. Was a seepage analysis for the embankment performed? ☐ Yes ☒ No

If yes, describe methodology used: See Section 5.3 - Attachment E Geotechnical Report

5. Was a seepage analysis for the foundation performed: ☐ Yes ☒ No

6. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☒ No

7. Were seepage exit gradients checked for piping potential? ☐ Yes ☒ No

8. The duration of 100-year (base) flood hydrograph against the embankment is 2 hours.

Note: **Attach engineering analysis to support construction plans.**

See Attachment E
Geotechnical Report

8. FLOODWALL AND FOUNDATION STABILITY

1. Describe analysis submittal based on Code:

☐ UBC (1988) or ☒ Other (specify): ACI

2. Stability analysis submitted provides for:

☒ Overturning ☒ Sliding; If not, explain: _____

3. Loading included in the analyses were: EQUIVALENT ACTIVE PRESSURE

☒ Lateral earth @ P_A = 40 psf; P_p = 300 psf

☐ Surcharge-Slope @ N/A, ☐ surface N/A psf

☐ Wind @ P_w = N/A psf

☐ Seepage (Uplift); N/A ☐ Earthquake @ P_{eq} = N/A %g

☐ 100-year significant wave height N/A ft.

☐ 100-year significant wave period N/A sec.

4. Summary of Stability Analysis Results: Factors of Safety. Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

TCR: 42+65 43+93.12

Loading Condition	Criteria (Min)		℄ Sta 43+35	To 44+65	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5	–	–		
Dead & Soil	1.5	1.5	–	–		
Dead, Soil, Flood, & Impact	1.5	1.5	2.84	1.53		
Dead, Soil, & Seismic	1.3	1.3	–	–		

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

5. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum	1198	N/A
Maximum allowable	2000	N/A

6. Foundation scour protection ☐ is, ☒ is not provided. Describe if provided:

_____

_____

_____

Note: Attach engineering analysis to support construction plans.

Attachment 0.

* PLEASE SEE ATTACHED ENGINEERING ANALYSIS.
ALSO SEE ATTACHED SUPPLEMENTAL RESPONSES FOR FORM 8.

9. SETTLEMENT

1. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☒ Yes ☐ No

2. The computed range of settlement is <0.08 ft. to <0.08 ft.

3. Settlement of the levee crest is determined to be primarily from:

   ☒ Foundation consolidation
   ☐ Embankment compression
   ☐ Other (describe):

   See Attachment E- Geotechnical Report
   Section 5.2 & Appendix D of Geotech. Report

4. Differential settlement of floodwalls

   ☒ has ☐ has not been accommodated in the structural design and construction.

Note: Attach engineering analysis to support construction plans.

10. INTERIOR DRAINAGE

1. Specify size of each interior watershed PLEASE SEE ATTACHMENT D, "Thompson Creek Interior Drainage Study" For SUPPORTING DATA; esp. Page 9 of Report

   Draining to pressure conduit: SEE ATTACHED SUPPLEMENTAL RESPONSE For Form 8

   Draining to ponding area: NONE

2. Relationships Established — PLEASE SEE ATTACH. D: Interior Drainage Study

Ponding elevation vs. storage	☑ Yes	☐ No	APPDX. E
Ponding elevation vs. gravity flow	☑ Yes	☐ No	APPDX. D
Differential head vs. gravity flow	☑ Yes	☐ No	APPDX. D-2
The river flow duration curve is enclosed	☑ Yes	☐ No	FIGURE 3

4. Specify the discharge capacity of the head pressure conduit: SEE ATTACH. D, APPDX. D-2 Interior Drainage Study AND Page 9 of Report

5. Which Flooding Conditions Were Analyzed?

• Gravity flow (Interior Watershed)	☑ Yes	☐ No	
• Common storm (River Watershed)	☑ Yes	☐ No	
• Historical ponding probability	☐ Yes	☑ No	
• Coastal wave overtopping	☐ Yes	☑ No	N/A - NOT COASTAL

If No, explain why not: NOT COASTAL

6. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☑ Yes ☐ No

If No, explain why not: _____

7. The rate of seepage through the levee system for the 100-year (base) flood is negligible cfs

10. INTERIOR DRAINAGE (Cont'd)

3. The length of levee system used to drive this seepage rate in item 7: 4300 ft.

Will a pumping plant(s) be used for interior drainage? ☐ Yes ☒ No

If Yes, include the number of pumping plants: _____
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operations be automatic? ☐ Yes ☐ No
If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: U.S. Army Corps of Engineers EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Note: **Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.**

11. OTHER DESIGN CRITERIA

1. The following items have been addressed as stated:

   Liquefaction ☐ is ☒ is not a problem
   Hydrocompaction ☐ is ☒ is not a problem
   Heave differential movement due to soils of high shrink/swell ☐ is ☒ is not a problem

2. For each of these problems, state the basic facts and corrective action taken:

   See Attachment E, Geotechnical Report
   Section 5.4; 2.1; & Table 2-1

3. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure? ☐ Yes ☒ No

Note: Attach supporting documentation

See Attachment E, Geotechnical Report

12. OPERATIONAL PLAN AND CRITERIA

1. Are the planned/installed works in full compliance with NFIP regulations, Section 44 CFR Ch. 1 1.65.10

   ☑ Yes ☐ No

2. Does the operation plan incorporate all the provisions for closure devices as required in Section 65.10(c)(1), of the NFIP regulations?

   ☑ Yes ☐ No NO CLOSURE DEVICES

3. Does the operation plan incorporate all the provisions for interior drainage as required in Section 65.10(c)(2), of the NFIP regulations?

   ☑ Yes ☐ No

If the answer is No to any of the above, please explain below.

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP? ☐ Yes ☐ No

If Yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No ☐ N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☐ Yes ☐ No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____ flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

(Name)

Operation and maintenance plans are attached. ☐ **Yes** ☐ **No** ☐ **N/A**

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☐ Yes Fee amount: $_____

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. ☐ Yes

Please see Instructions for Fee Amounts FOR LEVEE ANALYSIS

7. SIGNATURE

Note: **I understand that my signature indicates that all information submitted in support of this request is correct**

Mohammad AKhan
Signature of Revision Requester

MOHAMMAD A. KHAN, ASSOC. C.E.
Printed Name and Title of Revision Requester

SANTA CLARA VALLEY WATER DIST
Company Name

(408) 265-2600 2/28/00
Telephone No. Date

Note: **Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.**

_____
Signature of Community Official

_____
Printed Name and Title of Community Official

_____
Community Name

_____
Telephone No. Date

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is in accordance with 44 CFR Ch. 1, Sect 65.2

Mohammad AKhan
Signature

MOHAMMAD A. KHAN
ASSOC. CIVIL ENGINEER (Geotechnical)
Printed Name and Title of Revision Requester

Registr No 45559 Expires (Date) 6/30/00 State CA

Type of License/Expertise: Civil (Expertise in Geotechnical)

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ **Hydrologic** (3)	new or revised discharges
☐ **Hydraulic** (4)	new or revised water-surface elevations
☐ **Mapping** (5)	floodplain/floodway changes
☐ **Channelization** (6)	channel is modified
☐ **Bridge/Culvert** (7)	addition/revision of bridge/culvert
☐ **Levee/Floodwall** (8)	addition/revision of levee/floodwall
☐ **Coastal** (9)	new or revised coastal elevations
☐ **Coastal Structures** (10)	addition/revision of coastal structure
☐ **Dam** (11)	addition/revision of dam
☐ **Alluvial Fan** (12)	structures proposed on alluvial fan

SUPPLEMENTAL RESPONSES
LETTER OF MAP REVISION
FORM 8 - LEVEE/FLOODWALL SYSTEM ANALYSIS

THOMPSON CREEK, SAN JOSE, CALIFORNIA

SECTION 3: FREEBOARD

3. Tabulate elevations at critical locations:

Station	Location	100-year Water Surface Elevation	Levee Crest	Freeboard (ft.)
56+00	Upper End of Project	181.3	186.9	5.6
48+80	Upper end of South Levee	175.7	South Levee: 181.0	5.3
44+00	Concrete Floodwall, South Bank at Everdale Drive	172.5	177.5	5.0
43+35	Change in Levee crest grade, downstream of Everdale Drive	172.2	175.9	3.7
37+00	Pettigrew Court: Constriction to ½-width modified floodplain	165.6	169.6	4.0
21+89	Transition between channel-only and floodplain flow	150.9	154.8	3.9
21+04	Upstream end of the channel-only section AND change in levee crest grade	150.1	154.3	4.2
11+06	Just upstream of drop structure, upstream of Quimby Road	138.9	143.0	4.1

10+61	Upstream face of Quimby Road bridge - NOT LEVEED; water surface is below adjacent grade	134.8	138.8	4.0
8+55	Downstream of Quimby Road Bridge wingwall transition area	134.0	139.5	5.5

SECTION 4: SEDIMENT TRANSPORT CONSIDERATIONS

According to maintenance records, sediment deposition occurs on Thompson Creek in the reach downstream of the Quimby Road drop structure, to the confluence with Lower Silver Creek. Sediment deposition also occurs within the box culvert under Quimby Road.

Maintenance Program Guidelines for Thompson Creek (Attachment F) require that sediment be removed from the drop structure and culvert areas when the depth of uniform sediment deposition reaches 1 foot, or when the depth of localized sediment deposition (sediment bars) reaches 2 feet. For other areas of the improved channel, upstream of the Quimby Road drop structure, the Maintenance Guidelines allow for a uniform sediment deposition of 2 feet, or localized sediment deposition (sediment bars) of up to 4 feet. However, the areas upstream of the drop structure do not experience significant sediment deposition.

To investigate the effects of sediment on the project flood conveyance capacity, the post-project model (THOMPOST.DAT) was modified to incorporate two feet of sediment deposition in the reach between Lower Silver Creek (start of run) and the drop structure immediately upstream of Quimby Road (Station 11+05), using the X3 variable ELSED. The model demonstrates that FEMA freeboard requirements will be met even for the condition of maximum allowable sedimentation for 1% and 10% flows.

The model used to investigate sedimentation, THOMSED.DAT is included with this application.

SECTION 5: CLOSURES; QUESTION 1

Corrected & sent to Michael Baker Inc. 6/00 (See next sheet)

Six storm drain lines penetrate the levee system. One of the lines includes two outfalls, so seven outfall openings are listed on Form 8 Section 5 Question 1. All storm drains are equipped with flap-gates to prevent waters from backflowing out of the creek into the storm drain system. Information regarding the storm drains is presented in tabular form in Attachment C. Drawings showing the location of the outfalls and the design of the flap-gates can be found in Attachments A, C and H. These documents are the Map & Construction Plan from November 1980; the Plans

updated & sent to Michael Baker Inc. 6/9/00 (See next Sheets)

for Construction of Outfall Improvements from March 1994; and a Table showing stormdrains that penetrate the levee system.

SECTION 8: FLOODWALL AND FOUNDATION STABILITY CLOSURES

Engineering calculations are provided for the floodwall at station TCR 42+65 to 43+93.12, at Everdale Road. Attachment O contains the engineering analysis for this floodwall.

Another "floodwall" is noted on the 1980 Plans (Attachment A), just downstream of Quimby Creek, at approximately station 59+50 (Corresponding to station TCR 271+75 in the 1980 plans). This structure is upstream of the project area. In addition, this structure does not serve as a floodwall, as *the water surface for the 1% chance event does not reach the top of bank in this area, and therefore does not touch the base of the "floodwall"*. Therefore, no analysis is provided with this application.

SECTION 10: INTERIOR DRAINAGE

Question 1: Specify size of each interior watershed.

There are four interior watersheds, described in Attachment D: "Thompson Creek Interior Drainage Study".

Watershed #1:	4.0 acres
Watershed #2:	33.4 acres
Watershed #3:	38.0 acres
Watershed #4:	145.0 acres

10+61	Upstream face of Quimby Road bridge - NOT LEVEED; water surface is below adjacent grade	134.8	138.8	4.0
8+55	Downstream of Quimby Road Bridge wingwall transition area	134.0	139.5	5.5

SECTION 4: SEDIMENT TRANSPORT CONSIDERATIONS

According to maintenance records, sediment deposition occurs on Thompson Creek in the reach downstream of the Quimby Road drop structure, to the confluence with Lower Silver Creek. Sediment deposition also occurs within the box culvert under Quimby Road.

Maintenance Program Guidelines for Thompson Creek (Attachment F) require that sediment be removed from the drop structure and culvert areas when the depth of uniform sediment deposition reaches 1 foot, or when the depth of localized sediment deposition (sediment bars) reaches 2 feet. For other areas of the improved channel, upstream of the Quimby Road drop structure, the Maintenance Guidelines allow for a uniform sediment deposition of 2 feet, or localized sediment deposition (sediment bars) of up to 4 feet. However, the areas upstream of the drop structure do not experience significant sediment deposition.

To investigate the effects of sediment on the project flood conveyance capacity, the post-project model (THOMPOST.DAT) was modified to incorporate two feet of sediment deposition in the reach between Lower Silver Creek (start of run) and the drop structure immediately upstream of Quimby Road (Station 11+05), using the X3 variable ELSED. The model demonstrates that FEMA freeboard requirements will be met even for the condition of maximum allowable sedimentation for 1% and 10% flows.

The model used to investigate sedimentation, THOMSED.DAT is included with this application.

SECTION 5: CLOSURES; QUESTION 1

Five storm drain lines penetrate the levee system, each is listed on Form 8 Section 5 Question 1. All storm drains are equipped with flap-gates in manholes set back from the channel to prevent waters from backflowing out of the creek into the storm drain system. Information regarding the storm drains is presented in tabular form in Attachment H. Drawings showing the location of the outfalls and the design of the flap-gates can be found in Attachments A and C. These documents are the Map & Construction Plan from November 1980 and the Plans for Construction of Outfall

Improvements from March 1994.

SECTION 8: FLOODWALL AND FOUNDATION STABILITY CLOSURES

Engineering calculations are provided for the floodwall at station TCR 42+65 to 43+93.12, at Everdale Road. Attachment O contains the engineering analysis for this floodwall.

Another "floodwall" is noted on the 1980 Plans (Attachment A), just downstream of Quimby Creek, at approximately station 59+50 (Corresponding to station TCR 271+75 in the 1980 plans). This structure is upstream of the project area. In addition, this structure does not serve as a floodwall, as *the water surface for the 1% chance event does not reach the top of bank in this area, and therefore does not touch the base of the "floodwall"*. Therefore, no analysis is provided with this application.

SECTION 10: INTERIOR DRAINAGE

Question 1: Specify size of each interior watershed.

There are four interior watersheds, described in Attachment D: "Thompson Creek Interior Drainage Study".

Watershed #1:	4.0 acres
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Watershed #3:	38.0 acres
Watershed #4:	145.0 acres

ATTACHMENTS

LETTER OF MAP REVISION
THOMPSON CREEK, CITY OF SAN JOSE, CALIFORNIA

A. Map and Construction Plan for Thompson Creek, Lower Silver Creek, and Quimby Creek. Santa Clara Valley Water District. November, 1980 (as-built).

B. Map and Construction Plan for Thompson Creek from Quimby Road to Westgrove Lane. Santa Clara Valley Water District. March, 1991 (as-built). Plan sheets (sheets 4 - 7) have Post-Project Model cross-section locations plotted.

C. Plans for the Construction of Thompson Creek, Outfalls Improvements. City of San Jose. March, 1994.

D. "Thompson Creek Interior Drainage Study". Mark Thomas & Co. Inc. 1994.

E. "Geotechnical Investigation Report for Thompson Creek Levees". Earth Tech. June 1999.

F. Maintenance Program Guidelines. Channel Maintenance Program Guidelines extracted from "Thompson Creek Planning Study (Quimby Road to Westgrove Lane)", Santa Clara Valley Water District. August 1988. Levee Maintenance Guidelines also included.

G. Excerpt from FIS for City of San Jose; showing that Thompson Creek does not have a designated floodway.

H. Table: Thompson Creek, Quimby Road to Westgrove Lane, Stormdrains that Penetrate the Levee System.

I. Table: Thompson Creek and Lower Silver Creek Stationing

J. FIRM Maps Showing Revised Floodplain

K. Post-Project profile, Thompson Creek

L. Letter from Mayor of City of San Jose

M. Diskette containing Duplicate Effective Model (THOMPRE.DAT); Post-Project Conditions Model (THOMPOST.DAT); and Post-Project Model with Sediment, showing adequate capacity (THOMSED.DAT)

N. Printouts of runs for THOMPRE.DAT; THOMPOST.DAT; and THOMSED.DAT

O. Engineering Analysis for Floodwall at Station TCR 42+65 to 43+93.12

P. Santa Clara Valley Water District Act (Stats. 1951, c.1405, p. 3336, urgency, eff. July 10, 1951, as amended Stats.1963, c. 1941, p. 3993, § 1.)

Attachment A

Map and Construction Plan for Thompson Creek, Lower Silver Creek, and Quimby Creek Santa Clara Valley Water District November, 1980 (as-built)

THESE ARE OVERSIZED PLANS AND ARE INCLUDED SEPARATELY FROM THE APPLICATION BINDER

As Builts available in CPR Unit

4047 - 23-3-1 to 45

Attachment B

Map and Construction Plan for Thompson Creek from Quimby Road to Westgrove Lane Santa Clara Valley Water District March, 1991 (as-built)

Plan Sheets (sheets 4 - 7) have Post-Project Model Cross-Section Locations Plotted

THESE ARE OVERSIZED PLANS AND ARE INCLUDED SEPARATELY FROM THE APPLICATION BINDER

As-Builts Also Available in CPR Unit

4047 - 22-2-1 to 40

Attachment C

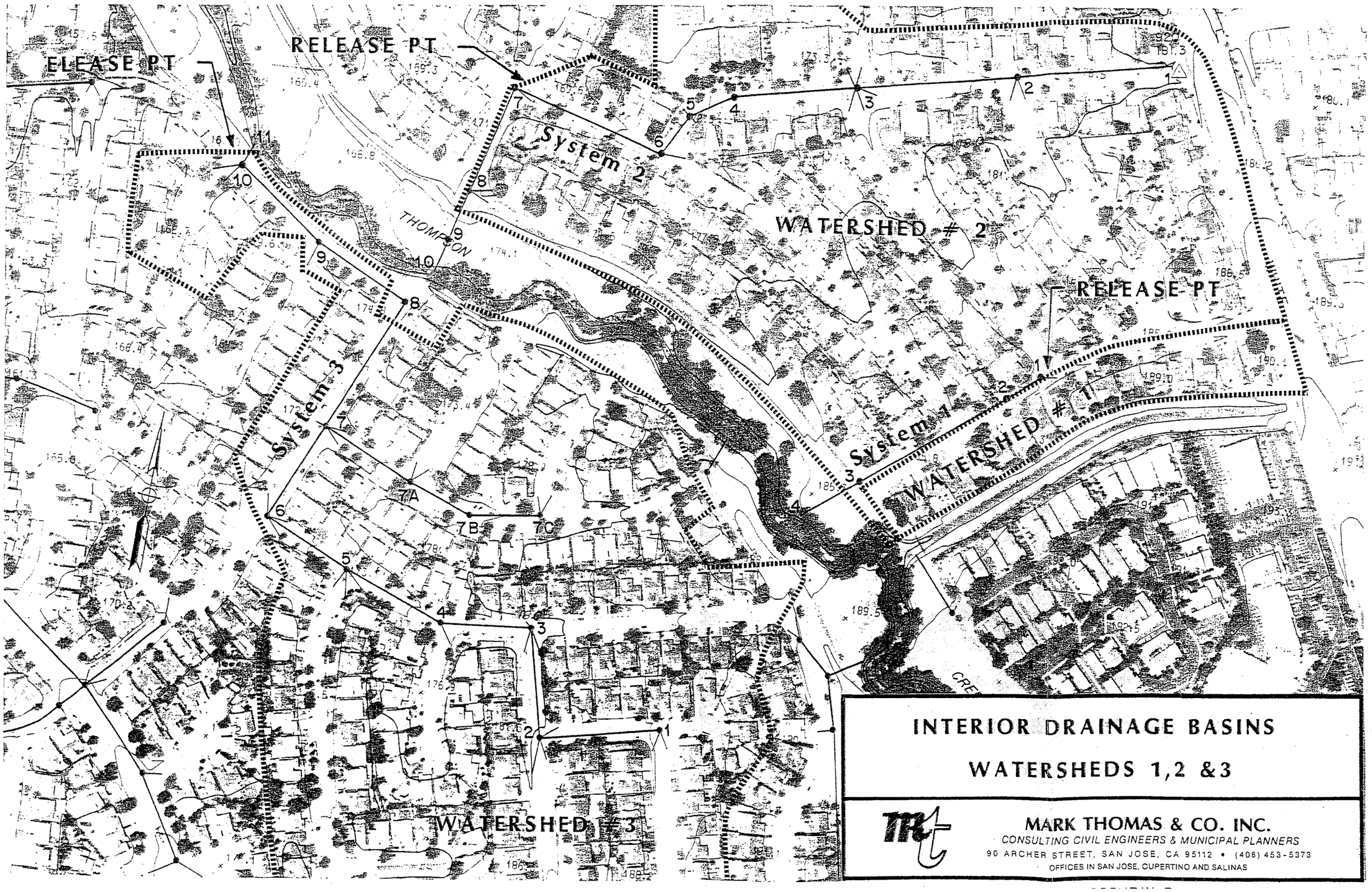
Plans for the Construction of Thompson Creek, Outfalls Improvements
City of San Jose
March, 1994

THESE ARE OVERSIZED PLANS AND ARE
INCLUDED SEPARATELY FROM THE APPLICATION BINDER

Attachment D

"Thompson Creek Interior Drainage Study"
Mark Thomas & Co. Inc.
1994

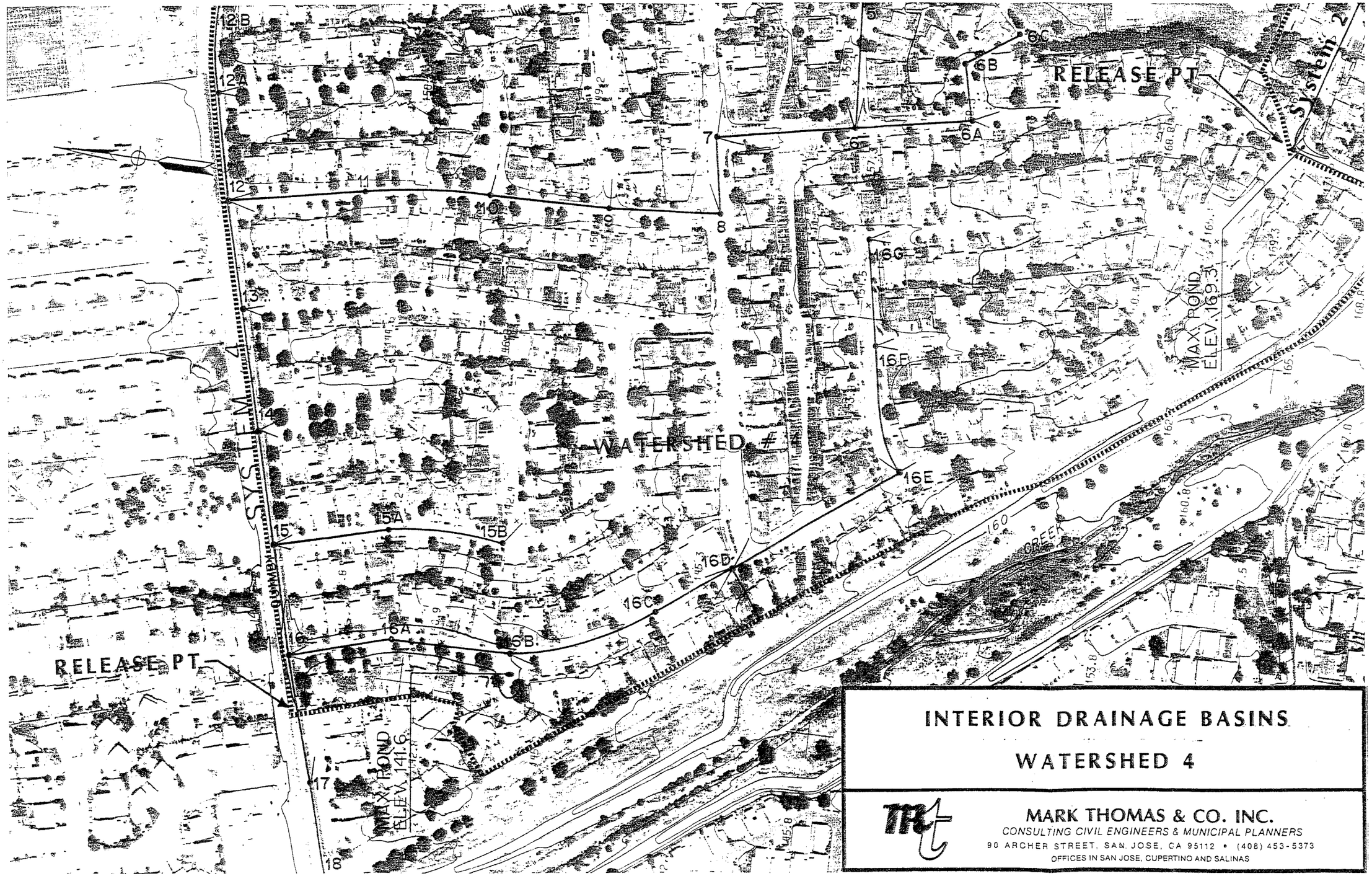
~~**THIS BOUND REPORT IS INCLUDED SEPARATELY FROM THE APPLICATION BINDER**~~



INTERIOR DRAINAGE BASINS

WATERSHEDS 1,2 &3

MARK THOMAS & CO. INC.
CONSULTING CIVIL ENGINEERS & MUNICIPAL PLANNERS
90 ARCHER STREET, SAN JOSE, CA 95112 • (408) 453-5373
OFFICES IN SAN JOSE, CUPERTINO AND SALINAS



INTERIOR DRAINAGE BASINS

WATERSHED 4

MARK THOMAS & CO. INC.
CONSULTING CIVIL ENGINEERS & MUNICIPAL PLANNERS
90 ARCHER STREET, SAN JOSE, CA 95112 • (408) 453-5373
OFFICES IN SAN JOSE, CUPERTINO AND SALINAS

THOMPSON CREEK FLOOD
CONTROL PROJECT

THOMPSON CREEK

INTERIOR DRAINAGE STUDY

LOMR Request

PREPARED FOR:

SANTA CLARA VALLEY WATER DISTRICT

PREPARED BY:

MARK THOMAS & CO.INC.

Sam J. Zullo
Project Manager

Date: April 28,1994

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THOMPSON CREEK FLOOD CONTROL PROJECT
REQUEST FOR LETTER OF MAP REVISION

PROJECT BACKGROUND

In 1980 channel improvements were constructed on Lower Silver Creek, between Tully Road and Thompson Creek, and on Thompson Creek between Lower Silver Creek and Quimby Creek. After completion of these channel improvements, a request for map revision was made to the Federal Emergency Management Agency (FEMA). This request was denied because that project did not meet the then recently adopted FEMA policy requiring a minimum of three feet of freeboard for leveed channels. In 1991, the Santa Clara Valley Water District (District) completed a levee improvement project on Thompson Creek between Quimby Road and Westgrove Lane in order to provide the required freeboard.

Subsequently, the District submitted a request, which included a technical information package, to FEMA that the Flood Insurance Rate Maps (FIRM) be revised to reflect these improvements. The District has since been informed that FEMA has adopted the use of detailed certification forms. A completed "Levee/Floodwall System Analysis Form" (form 8) must be submitted to FEMA before they will begin a detailed review of the requested map revision.

OBJECTIVE OF THIS STUDY

The objective of this study is to provide the necessary engineering analysis to complete questions 1 through 6 of the interior drainage portion (page 7, form 8) of the FEMA form for the application for a Letter of Map Revision (LOMR). The work required to complete this portion of the LOMR Request includes analysis of the reach of Thompson Creek between Westgrove Ln. and Quimby Rd. and the interior drainage basins affected by that reach of Thompson Creek.

AREA CHARACTERISTICS

LOCATION

The study area is in the City of San Jose. San Jose is located at the foot of the Santa Cruz and Diablo Mountain Ranges in central Santa Clara County near California's Central Coastline. The city encompasses approximately 150 square miles and extends from the foothills outward on the alluvial plain of Santa Clara Valley. San Jose is approximately 55 miles southeast of San Francisco, approximately 390 miles northwest of Los Angeles, and approximately 25 linear miles northeast of Santa Cruz and the Pacific Ocean. San Jose shares a common border with the cities of Sunnyvale, milpitas, Santa Clara, Campbell,

Los Gatos, Saratoga, Cupertino, Morgan Hill, and unincorperated areas of Santa Clara County. (see Figure #1)

CLIMATE

The climate of the study area is classified as Marine Mediterranean, with cool, moist winters and warm dry summers with occasional fog in the morning hours. The average maximum daily temperature are 58 degrees F in January and 81 degrees F in July. Rainfall in the area averages approximately 14 inches per year, with about 90% occurring between December and March. Violent thunderstorms, snowfall, and other extreme weather conditions are rare. The marine influence from the Pacific Ocean and the proximity to the Dan Francisco Bay have a substantial moderating effect on the local climate.

TOPOGRAPHY

The study area is located on the eastern side of the San Jose near the base of the Diablo Mountain Range in the center of Santa Clara County. The Santa Clara Valley consists primarily of alluvial bottomlands, terraces, and foothills. The valley is surrounded by the Diablo Mountain Range to the east, the Santa Cruz Mountains to the south and west, and the San Francisco Bay to the north. The crest elevations of these mountains can exceed 3000 feet. The two major rivers which flow through the Santa Clara Valley are the Coyote River and the Guadalupe River. Thompson Creek, which flows into the Coyote River, is located between 130 feet and 180 feet above mean sea level within the study area.

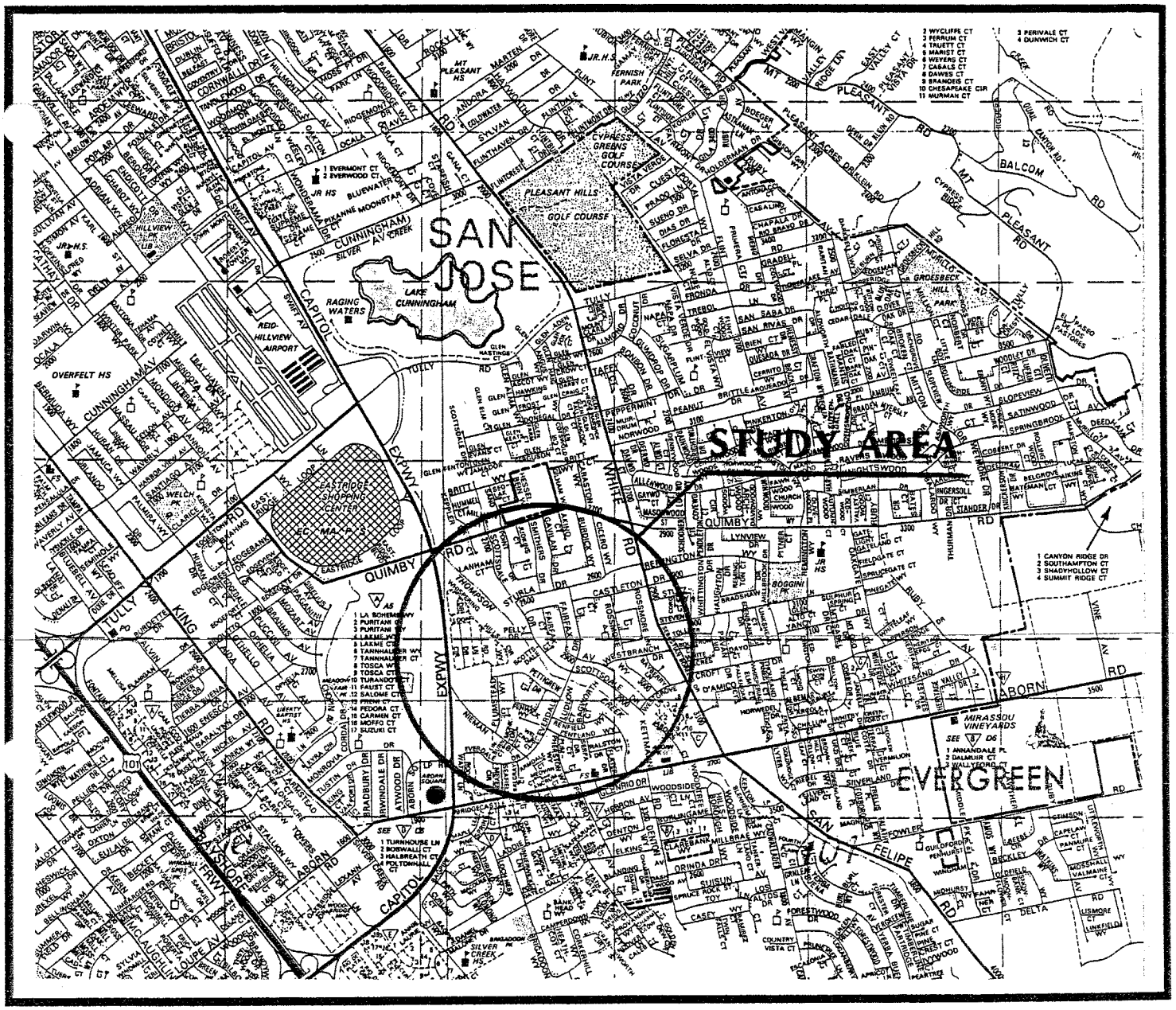
NATIONAL FLOOD INSURANCE RATE MAP PROGRAM

The study area is currently covered by Flood Insurance Rate Maps (FIRM) 060349 0027 D and 060349 0033 D with an effective date of August 2, 1982. Currently 78 parcels are located within Zone A0 of the FIRM (see Figure #2) which are now protected by levee from a 100-year flooding event. Additionally, Figure #1 delineates the map area for which the LOMR is requested. It is further recommended that the map be revised from the current Zone A0 designation to a Zone D designation.

FLOOD INSURANCE ZONES

Flood instance zones and zone numbers are assigned based on the type of flood hazard and the possible Flood Hazard Factor (FHF), respectively. A unique zone number is associated with each FHF, and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 of greater.

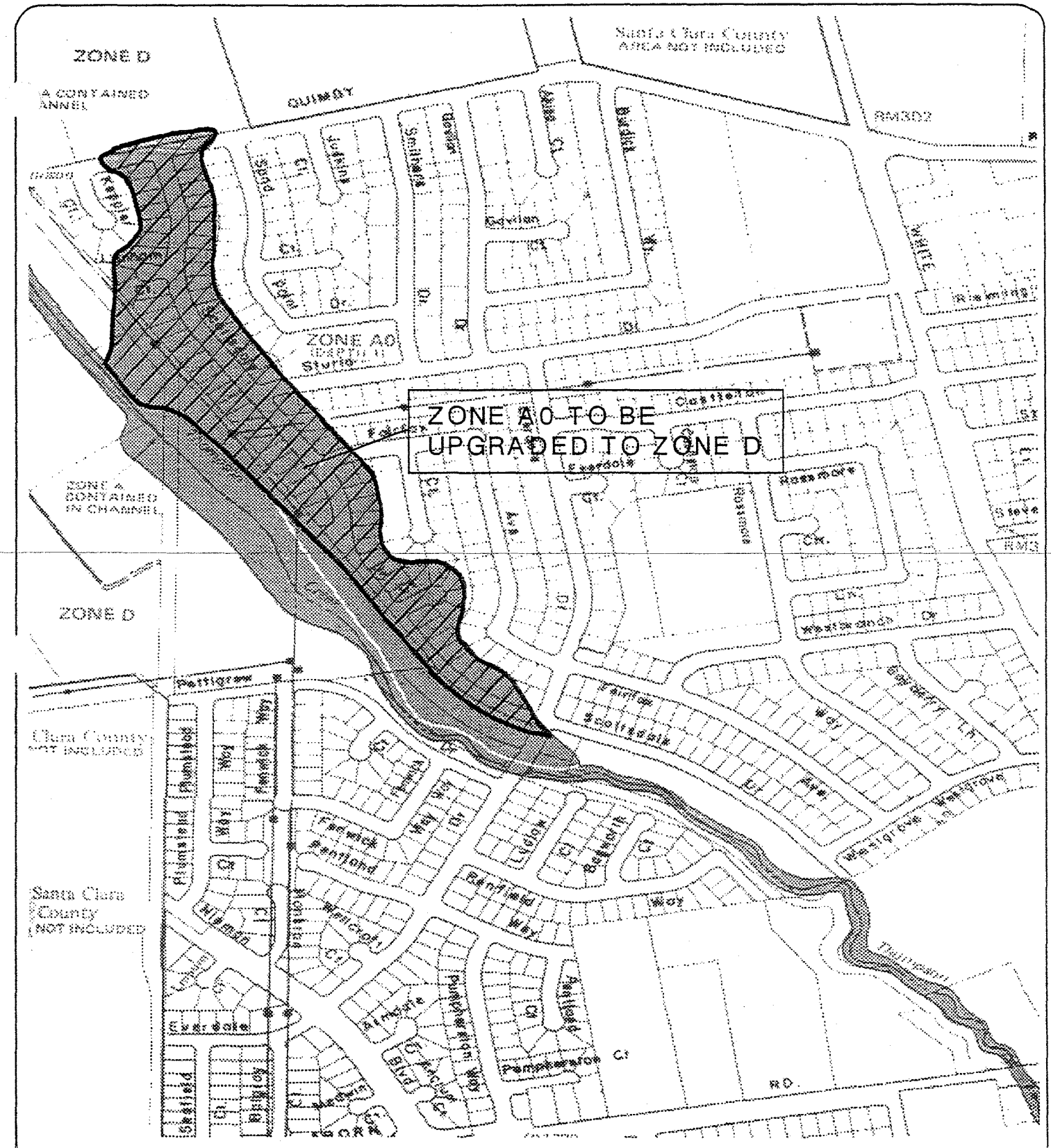
Zone A:	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
Zone AO:	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of



VICINITY MAP
CITY OF SAN JOSE

Approximate scale
1"= 1 mile

FIGURE 1



FLOOD INSURANCE RATE MAP
THOMPSON CREEK AREA

MAP PANELS 060349 0027 D & 060349 0033 D

FIGURE 2

	inundation are shown, but no flood hazard factors are determined.
Zone AH:	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
Zone A1-A30:	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
Zone A99:	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
Zone B:	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the bade flood. (Medium shading)
Zone C:	Areas of minimal flooding. (No shading)
Zone D:	Areas of undetermined, but possible, flood hazards.
Zone V:	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.
Zone V1-V30:	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

ANALYSIS

HYDROLOGY

The first step in analyzing an areas drainage capability is to determine how much rain will fall in a given time period for a given storm event. For the purpose of this report only a one percent storm event is being used, that is a storm which statistically speaking has the probability of occurring once every one hundred years. The various computer programs used in this study require special rainfall data which include a rainfall intensity-duration-frequency curve and the amount of rain in inches that can be expected to fall in a 24 hour period for the given storm event.

The storm drain analysis computer program used requires the input of a rainfall intensity vs. duration curve. This rainfall intensity-duration-frequency curve was developed using the California Department of transportation's Intensity-Duration-Frequency Curve

Program version 2.0 for a 100-year storm event (see Appendix A). This program uses local gauging stations to the historical data necessary to develop this curve.
The computer program used to generate Unit Hydrographs for the area require a 24 hour storm total. Data obtained from the San Jose Gauging Station located in downtown San Jose, indicate a value of 3.95 inches of rain can be expected to fall during a 24 hour period for a 100-year storm. This gauging station is owned by the National Weather Service, operated by the City of San Jose and has over one hundred years of historical data.

THOMPSON CREEK

There are four interior drainage basins or watersheds affected by the new levees along Thompson creek between Quimby Rd. and Westgrove Lane. Each of these interior watersheds has a piped storm drain network or system. These watersheds and drainage systems have been verified using the City of San Jose Storm Drain Maps and field survey information and are delineated and identified in Appendix D and Attachment A.

Using the HEC-2 data file of Thompson Creek provided by the District to determine the 100 year water surface elevations at the four interior drainage system outfalls and field survey information it was determined that pipe systems 1 through 3 experienced a period of non-operation. In order to determine the magnitude of this time period, 12 different water surface profiles were developed by varying the flow rate (Q) for the HEC-2 data file.(see Appendix B-1) Comparing these water surface elevations with the City of San Jose Storm Drain Maps, field survey information and the 100 Yr. hydrograph for Thompson Creek (Figure 3), these periods of non-operation were estimated for each storm system of the interior drainage basins as follows; Pipe system 1 is non-operational for approximately 2 hours, while pipe systems 2 & 3 are non-operational for 22 hours during the 24 hour storm. (see Appendix B-2)

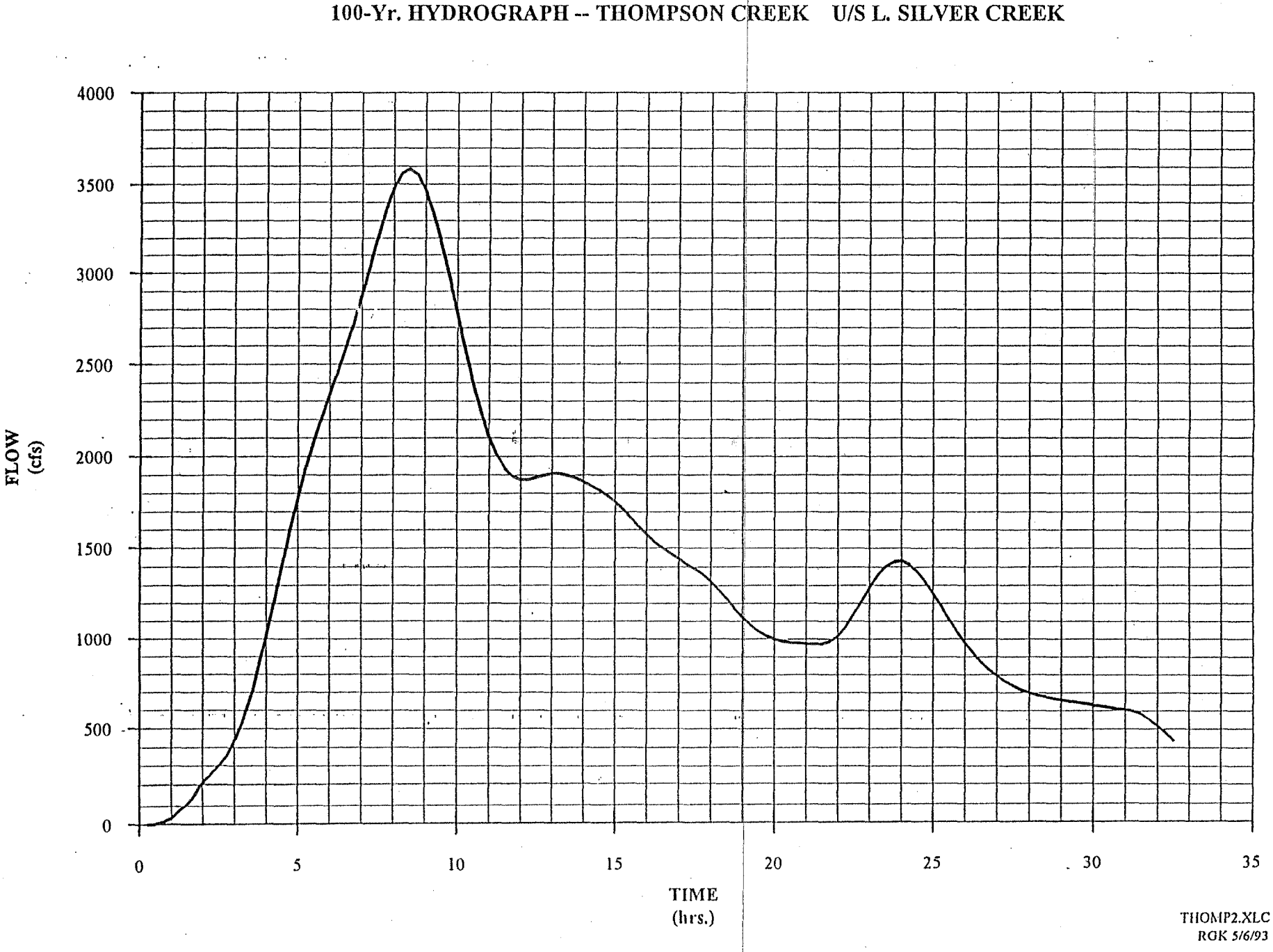
SYSTEM #	HOURS OF NON-OPERATION
1	2
2	22
3	22
4	0

INTERIOR DRAINAGE BASINS

PIPE SYSTEM ANALYSIS

The four storm drainage pipe systems servicing the interior watersheds within the study area, as shown in Attachment A and Appendix D, were analyzed for their hydraulic characteristics using the Mark Thomas Storm Computer Program. This program uses the Rational Method to determine the quantity of flow (Q) and uses Manning equation for pipe capacity and flow velocities. See Appendix D-1 for sample printout and explanation of results. Each interior drainage watershed was divided into sub-basins tributary to each

FIGURE 3


100-Yr. HYDROGRAPH -- THOMPSON CREEK U/S L. SILVER CREEK
FLOW (cfs)
4000
3500
3000
2500
2000
1500
1000
500
0
0
5
10
15
20
25
30
35
TIME (hrs.)
THOMP2.XLC
RGK 5/6/93

inlet. The area was calculated for these tributary areas using a digitizing table and runoff coefficients assigned for each sub-basin. Pipe length, slope, and size were taken from the City of San Jose Drainage Maps and field survey information. All four drainage systems were shown to be inadequate during a 100 yr. event (see Appendix D-2). This is due to the fact that the City of San Jose designs their drainage systems to carry the storm runoff for a 2 yr. storm event. Systems 1 through 3 are shown to be non-operational for varying times during a 100 year storm event. (see Appendix B-2)

At the time of this report flap gates were not present, although each drainage system was analyzed based on the assumption of flap gates being installed.

INTERIOR BASIN HYDROGRAPHS

Tabular Hydrographs were developed for each interior watershed using the computer program QTR-55 by Haestad Methods (see Appendix C). These Tabular Hydrographs were developed for a 100 year storm event of 24 hour duration. The program QTR-55 uses methodologies defined in Technical Release No. 55 (TR-55) "Urban Hydrology for Small Watersheds" by the United States Soil Conservation Service. This program requires input values for Area, Runoff Curve Numbers (CN), Time of Concentration (TC) and the total precipitation for a 24 hour period. The CN value is based on soil group and type of development. The Hydrologic Soil Group for the San Jose area is given as Type B from Exhibit A-1 of TR-55. The corresponding CN for residential areas of ¼ acre average lot size is 75 from Table 2-2a of TR-55. The hydrograph for the interior basin served by pipe system #4 includes the tributary area for watersheds #1 and #2. Pipe systems #1 & #2 have been shown to be non-operational during the peak time period of the storm, and therefore become part of watershed #4. Runoff volumes were then calculated for these basins using the time periods the drainage systems were non-operational and the corresponding hydrograph. (see Appendix E)

STORAGE VOLUMES

Release Points, ponding areas, average pond depths and storage volumes were determined for each basin using topographic maps, a hand level, and known elevations from field survey and as-built plans. Storage volumes were then calculated for these basins. Using the Tabular Hydrograph for each area, the allowable storage volume, and the pipe system capacity, storage curves were then developed. Pond overflow rates were then determined for these storage areas based on the maximum pond elevations. (see Appendix E)

RESPONSES TO QUESTIONS 1 THROUGH 6 OF FORM 8 FOR INTERIOR DRAINAGE

1. Specify size of each interior watershed.

   Four interior watersheds were looked at:

   Watershed #1 contains approximately 4.0 acres which drains to pressure conduit. (see Attachment A)

   Watershed #2 contains approximately 33.4 acres which drains to pressure conduit. (see Attachment A)

   Watershed #3 contains approximately 38.0 acres which drains to pressure conduit. (see Attachment A)

   Watershed #4 contains approximately 145.0 acres which drains to pressure conduit. (see Attachment A)

   No watersheds drain to ponding areas.

2. Relationships established.

Ponding elevation vs. storage	YES	(See Appendix E)
Ponding elevation vs. gravity flow	YES	(See Appendix D)
Differential head vs. gravity flow	YES	(See Appendix D-2)

3. The river flow duration curve is enclosed

   Thompson Creek hydrograph for 100 Yr. storm is included. (See Figure 3)

4. Specify the discharge capacity of the pressure conduit.

Drainage system # 1 has a discharge capacity of 2.2 CFS	(See Appendix D-2)
Drainage system # 2 has a discharge capacity of 11.5 CFS	(See Appendix D-2)
Drainage system # 3 has a discharge capacity of 25.4 CFS	(See Appendix D-2)
Drainage system # 4 has a discharge capacity of 31.3 CFS	(See Appendix D-2)

5. Which flooding conditions were analyzed?

Gravity flow (Interior Watershed)	yes	(See Appendix D-2)
Common Storm (River Watershed)	yes	(SCVWD)
Historical ponding probability	no	
Coastal wave overtopping	no	

Coastal wave overtopping is not applicable in this situation.

6. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. yes

CONCLUSIONS

The levees along Thompson Creek between Quimby Rd. and Westgrove Ln. create no substantial barrier for interior drainage that might contribute to local flooding. Storm drainage systems #1, #2, and #3 would not function during peak times of a 100 year storm event with or without the levees in place. During this peak time, watershed #1 and #2 have an insignificant pond capacity. When these capacities are reached, storm runoff overflows through the streets and into watershed #4. Watershed #4 has a significant runoff storage volume which is exceeded at 8.8 hours resulting in storm runoff overflow along Quimby Road and into Thompson Creek. Watershed #3 reaches its runoff storage capacity at 7.9 hours which results in storm runoff overflow along Pettigrew Drive, away from THOMPSON Creek, to the adjoining storm drainage system.
Between the capacity of storm system #4 and the amount of overflow to the streets from all four watersheds, no residences will be affected by the minimal interior basin flooding. Therefore it is recommended that the FIRM Map be revised to show the updated limits as shown on figure 2.

REFERENCES

Santa Clara County Drainage Manual , 1966

Technical Release No. 55 (TR-55) Urban Hydrology for Small Watersheds

Federal emergency Management Agency, Flood Insurance Study, City of San Jose, Santa Clara County, California, 1986

City of San Jose, Public Works Department, Storm Drain System Maps, 1990

Santa Clara Valley Water District, Thompson Creek, Quimby Road to Westgrove Lane Plan and TCL Profile, December 1989

APPENDIX A

RAINFALL INTENSITY-DURATION-FREQUENCY CURVE

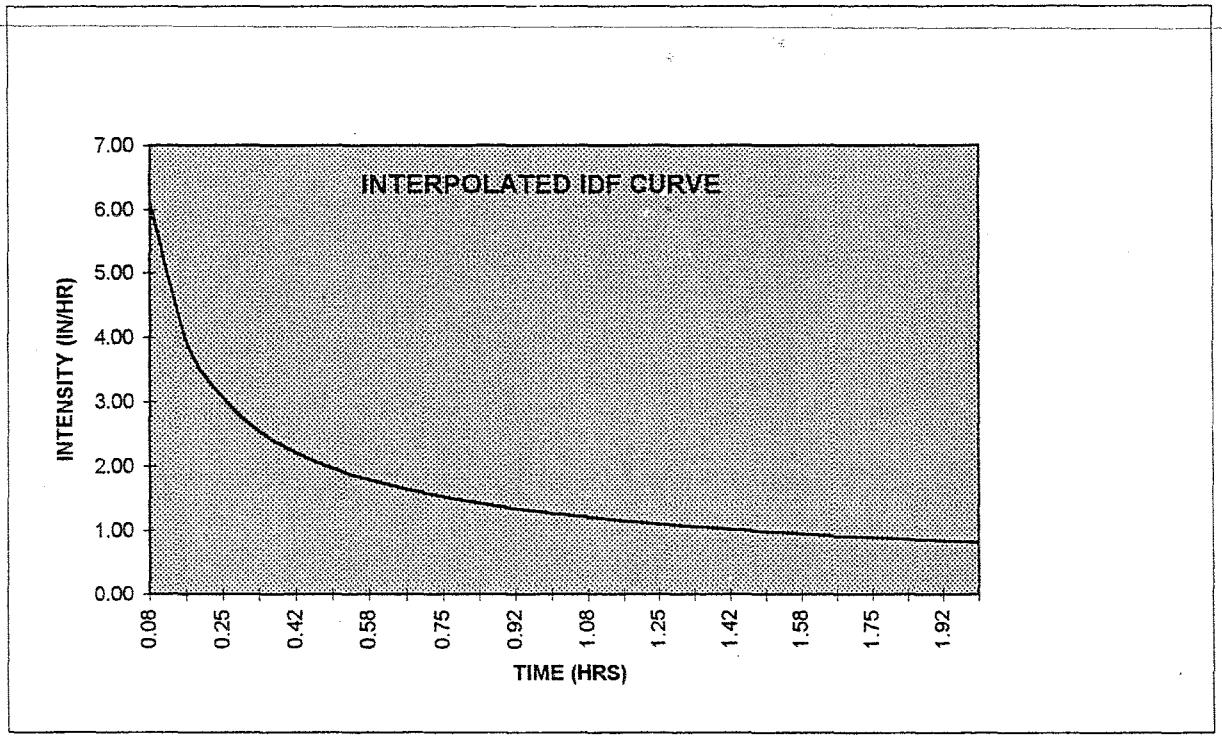
CALTRANS IDF PROGRAM

INTER-STATION INTERPOLATION RESULTS

RETURN PERIOD: 100 YEARS

GAUGING STATION	LAT	LONG	ELEV	1-HOUR INTENSITY	IDF CURVE LOG-LOG SLOPE
PENITENCIA	37.39	121.83	260	1.43	-0.726
PENITENCIA WTP	37.24	121.83	469	1.16	-0.568
USER-DEFINED SITE	37.32	121.80	150	1.27	-0.633

EQUATION: $I(D,RP)=1.27D^{-0.633}$



APPENDIX A

APPENDIX B

SUMMARY OF TAILWATER ELEVATIONS

TABLE B-1
SUMMARY OF TAILWATER ELEVATIONS
IN THOMPSON CREEK AT SYSTEM OUTFALLS

SYSTEM OUTFALL #	CHANNEL CL STATION	Q (CFS) 3500	3200	2920	2530	2430	2100	1944	1460	1215	970	800	720
1	56+00	183.48	182.52	181.72	180.72	180.32	179.75	179.44	178.42	177.84	177.17	176.65	176.38
2	44+15	173.30	173.12	172.91	172.65	172.55	172.35	172.24	171.91	171.36	170.99	169.78	168.57
3	38+00	166.88	166.74	166.67	166.51	166.46	166.30	166.25	165.99	165.79	165.60	165.11	164.18
4	10+10	135.44	135.11	134.91	134.51	134.41	133.96	133.84	133.19	132.81	132.41	132.04	131.94

182.52 TAILWATER ELEVATION WHERE SYSTEM #1 BECOMES NON-OPERATIONAL
169.78 TAILWATER ELEVATION WHERE SYSTEM #2 BECOMES NON-OPERATIONAL
165.11 TAILWATER ELEVATION WHERE SYSTEM #3 BECOMES NON-OPERATIONAL

APPENDIX B-1

TABLE B-2
FLOW DURATIONS FOR VARYING FLOW RATES FROM 100 YEAR HYDROGRAPH (SEE FIGURE 3)

TIME INTO STORM IN WHICH GIVEN FLOW RATE (Q) OCCURS	FLOW (Q) (CFS) 3500	3200	2920	2530	2430	2100	1944	1460	1215	970	800	720
START TIME	8.0	7.4	7.1	6.4	6.2	5.5	5.2	4.6	4.2	3.9	3.7	3.6
FINISH TIME	8.9	9.4	9.8	10.3	10.5	11.0	11.5	16.9	25.1	26.0	26.9	27.6
TIME THAT DRAINAGE SYSTEMS ARE NON-OPERATIONAL												
SYSTEM # 1		2 HRS *										
SYSTEMS # 2 & #3											23.2 HRS *	

* DURATION TIMES CORRESPOND TO THOMPSON CREEK 100-YEAR HYDROGRAPH FLOWS

APPENDIX C

100 YEAR HYDROGRAPHS INTERIOR BASINS

SYSTEM #1

Quick TR-55 Version: 5.41 S/N: 1240545033 Page 1

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-06-1993 20:36:13
Watershed file: --> SYSTEM1 .WSD
Hydrograph file: --> SYSTEM1 .HYD

SYSTEM 1
THOMPSON CREEK OUTFALL AT WESTGROVE LN

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
area1	4.00	75.0	0.20	0.00	3.95	1.63	.17 .10

* Travel time from subarea outfall to composite watershed outfall point.
Total area = 4.00 acres or 0.00625 sq.mi
Peak discharge = 2 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea ,cription	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
area1	0.17	0.00	0.20	0.00	No	--

* Travel time from subarea outfall to composite watershed outfall point.

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-06-1993 20:36:13
Watershed file: --> SYSTEM1 .WSD
Hydrograph file: --> SYSTEM1 .HYD

SYSTEM 1
THOMPSON CREEK OUTFALL AT WESTGROVE LN

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
area1	2	8.1
Composite Watershed	2	8.1

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-06-1993 20:36:13
Watershed file: --> SYSTEM1 .WSD
Hydrograph file: --> SYSTEM1 .HYD

SYSTEM 1
THOMPSON CREEK OUTFALL AT WESTGROVE LN

Composite Hydrograph Summary (cfs)

Subarea Description	7.0 hr	7.3 hr	7.6 hr	7.9 hr	8.0 hr	8.1 hr	8.2 hr	8.3 hr	8.4 hr
area1	0	0	0	1	1	2	2	1	1
Total (cfs)	0	0	0	1	1	2	2	1	1

Subarea Description	8.5 hr	8.6 hr	8.7 hr	8.8 hr	9.0 hr	9.2 hr	9.4 hr	9.6 hr	9.8 hr
area1	1	1	1	1	1	1	1	0	0
Total (cfs)	1	1	1	1	1	1	1	0	0

Subarea Description	10.0 hr	10.3 hr	10.6 hr	11.0 hr	11.5 hr	12.0 hr	12.5 hr	13.0 hr	13.5 hr
area1	0	0	0	0	0	0	0	0	0
Total (cfs)	0	0	0	0	0	0	0	0	0

Subarea Description	14.0 hr	15.0 hr	16.0 hr	18.0 hr	22.0 hr
area1	0	0	0	0	0
Total (cfs)	0	0	0	0	0

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-06-1993 20:36:13
Watershed file: --> SYSTEM1 .WSD
Hydrograph file: --> SYSTEM1 .HYD

SYSTEM 1
THOMPSON CREEK OUTFALL AT WESTGROVE LN

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
7.0	0	10.8	0
7.1	0	10.9	0
7.2	0	11.0	0
7.3	0	11.1	0
7.4	0	11.2	0
7.5	0	11.3	0
7.6	0	11.4	0
7.7	0	11.5	0
7.8	1	11.6	0
7.9	1	11.7	0
8.0	1	11.8	0
8.1	2	11.9	0
8.2	2	12.0	0
8.3	1	12.1	0
8.4	1	12.2	0
8.5	1	12.3	0
8.6	1	12.4	0
8.7	1	12.5	0
8.8	1	12.6	0
8.9	1	12.7	0
9.0	1	12.8	0
9.1	1	12.9	0
9.2	1	13.0	0
9.3	1	13.1	0
9.4	1	13.2	0
9.5	1	13.3	0
9.6	0	13.4	0
9.7	0	13.5	0
9.8	0	13.6	0
9.9	0	13.7	0
10.0	0	13.8	0
10.1	0	13.9	0
10.2	0	14.0	0
10.3	0	14.1	0
10.4	0	14.2	0
10.5	0	14.3	0
10.6	0	14.4	0
10.7	0	14.5	0

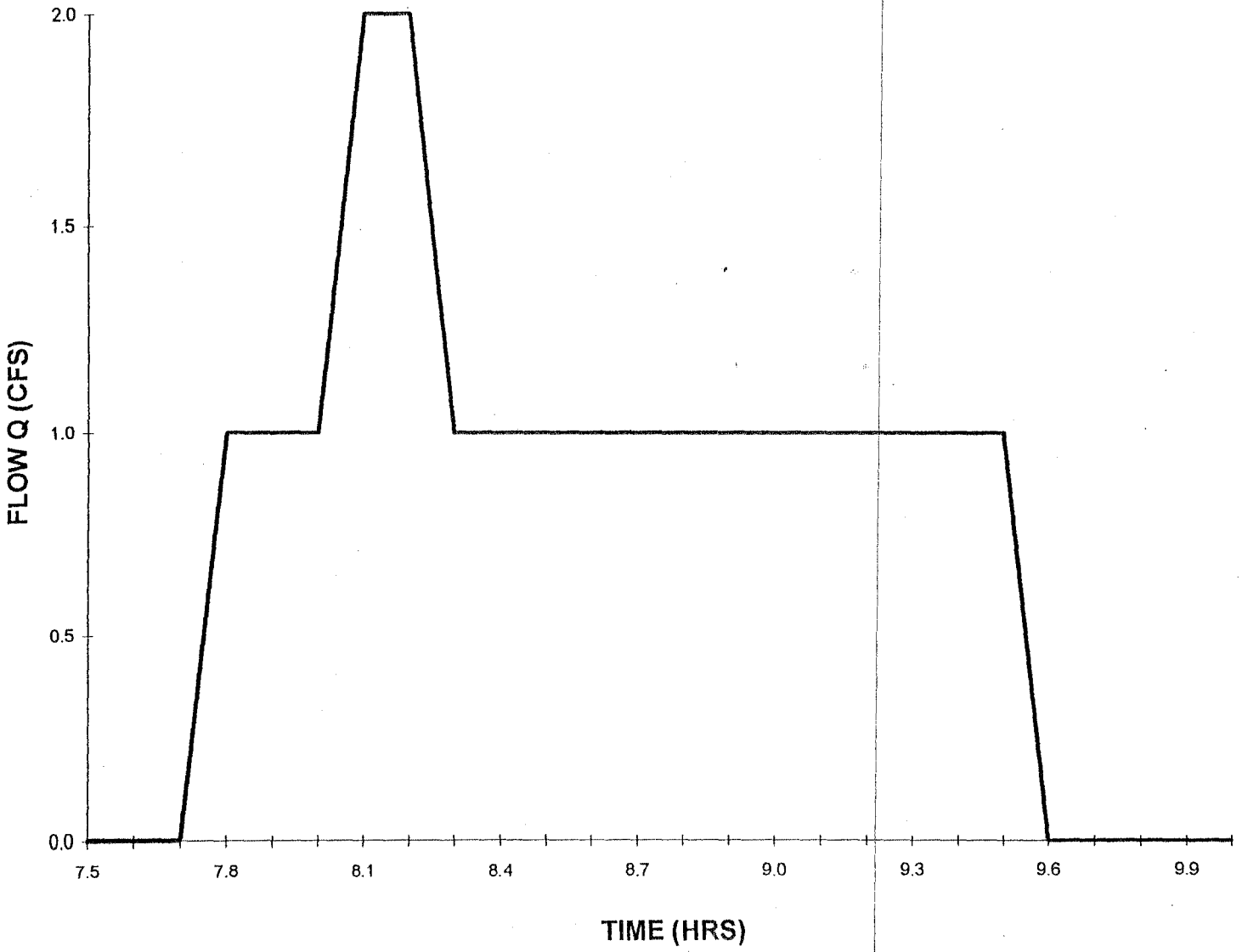
TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-06-1993 20:36:13
Watershed file: --> SYSTEM1 .WSD
Hydrograph file: --> SYSTEM1 .HYD

SYSTEM 1
THOMPSON CREEK OUTFALL AT WESTGROVE LN

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
14.6	0	18.4	0
14.7	0	18.5	0
14.8	0	18.6	0
14.9	0	18.7	0
15.0	0	18.8	0
15.1	0	18.9	0
15.2	0	19.0	0
15.3	0	19.1	0
15.4	0	19.2	0
15.5	0	19.3	0
15.6	0	19.4	0
15.7	0	19.5	0
15.8	0	19.6	0
15.9	0	19.7	0
16.0	0	19.8	0
16.1	0	19.9	0
16.2	0	20.0	0
16.3	0	20.1	0
16.4	0	20.2	0
16.5	0	20.3	0
16.6	0	20.4	0
16.7	0	20.5	0
16.8	0	20.6	0
16.9	0	20.7	0
17.0	0	20.8	0
17.1	0	20.9	0
17.2	0	21.0	0
17.3	0	21.1	0
17.4	0	21.2	0
17.5	0	21.3	0
17.6	0	21.4	0
17.7	0	21.5	0
17.8	0	21.6	0
17.9	0	21.7	0
18.0	0	21.8	0
18.1	0	21.9	0
18.2	0		
18.3	0		

100-YR HYDROGRAPH -- WESTGROVE LN - SYSTEM #1



APPENDIX C

SYSTEM #2

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 01-27-1994 14:05:32
Watershed file: --> SYSTEM2 .WSD
Hydrograph file: --> SYSTEM2 .HYD

SYSTEM 2
EVERDALE OUTFALL ON EAST SIDE OF THOMPSON CREEK

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input	Ia/p used
AREA 2	33.40	75.0	0.30	0.00	3.95	1.63	.17	.10

* Travel time from subarea outfall to composite watershed outfall point.
Total area = 33.40 acres or 0.05219 sq.mi
Peak discharge = 12 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	Input Values * Tt (hr)	Rounded Values Tc (hr)	Rounded Values * Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
AREA 2	0.33	0.00	0.30	0.00	No	--

* Travel time from subarea outfall to composite watershed outfall point.

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 01-27-1994 14:05:32
Watershed file: --> SYSTEM2 .WSD
Hydrograph file: --> SYSTEM2 .HYD

SYSTEM 2
EVERDALE OUTFALL ON EAST SIDE OF THOMPSON CREEK

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
AREA 2	12	8.1
Composite Watershed	12	8.1

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 01-27-1994 14:05:32
Watershed file: --> SYSTEM2 .WSD
Hydrograph file: --> SYSTEM2 .HYD

SYSTEM 2
EVERDALE OUTFALL ON EAST SIDE OF THOMPSON CREEK

Composite Hydrograph Summary (cfs)

Subarea Description	7.0 hr	7.3 hr	7.6 hr	7.9 hr	8.0 hr	8.1 hr	8.2 hr	8.3 hr	8.4 hr
AREA 2	2	3	3	8	10	12	12	12	11
Total (cfs)	2	3	3	8	10	12	12	12	11

Subarea Description	8.5 hr	8.6 hr	8.7 hr	8.8 hr	9.0 hr	9.2 hr	9.4 hr	9.6 hr	9.8 hr
AREA 2	9	8	7	6	6	5	5	4	4
Total (cfs)	9	8	7	6	6	5	5	4	4

Subarea Description	10.0 hr	10.3 hr	10.6 hr	11.0 hr	11.5 hr	12.0 hr	12.5 hr	13.0 hr	13.5 hr
AREA 2	4	4	3	3	3	3	3	3	3
Total (cfs)	4	4	3	3	3	3	3	3	3

Subarea Description	14.0 hr	15.0 hr	16.0 hr	18.0 hr	22.0 hr
AREA 2	3	3	2	2	2
Total (cfs)	3	3	2	2	2

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 01-27-1994 14:05:32
Watershed file: --> SYSTEM2 .WSD
Hydrograph file: --> SYSTEM2 .HYD

SYSTEM 2
EVERDALE OUTFALL ON EAST SIDE OF THOMPSON CREEK

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
7.0	2	10.8	3
7.1	2	10.9	3
7.2	3	11.0	3
7.3	3	11.1	3
7.4	3	11.2	3
7.5	3	11.3	3
7.6	3	11.4	3
7.7	5	11.5	3
7.8	6	11.6	3
7.9	8	11.7	3
8.0	10	11.8	3
8.1	12	11.9	3
8.2	12	12.0	3
8.3	12	12.1	3
8.4	11	12.2	3
8.5	9	12.3	3
8.6	8	12.4	3
8.7	7	12.5	3
8.8	6	12.6	3
8.9	6	12.7	3
9.0	6	12.8	3
9.1	5	12.9	3
9.2	5	13.0	3
9.3	5	13.1	3
9.4	5	13.2	3
9.5	5	13.3	3
9.6	4	13.4	3
9.7	4	13.5	3
9.8	4	13.6	3
9.9	4	13.7	3
10.0	4	13.8	3
10.1	4	13.9	3
10.2	4	14.0	3
10.3	4	14.1	3
10.4	4	14.2	3
10.5	3	14.3	3
10.6	3	14.4	3
10.7	3	14.5	3

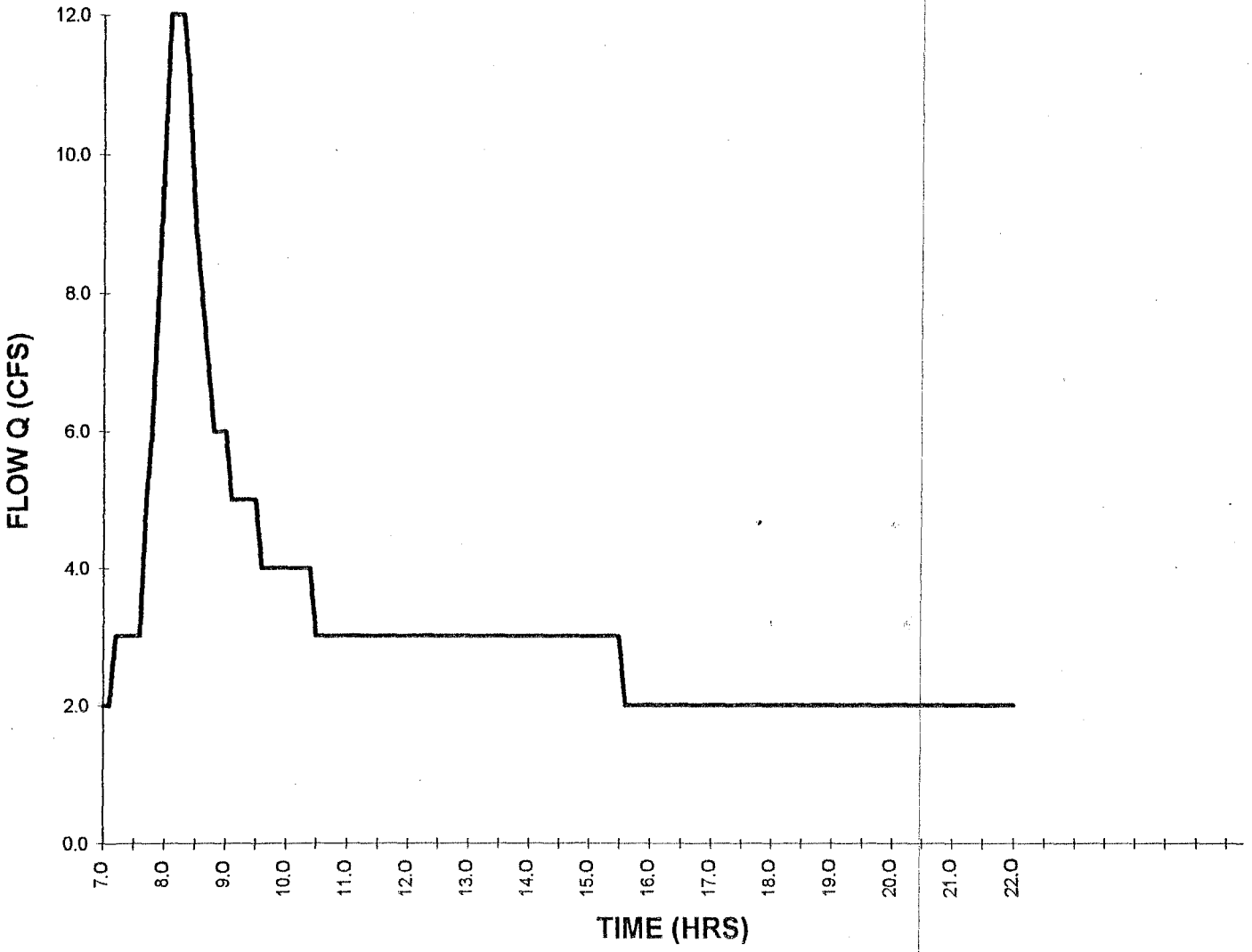
TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 01-27-1994 14:05:32
Watershed file: --> SYSTEM2 .WSD
Hydrograph file: --> SYSTEM2 .HYD

SYSTEM 2
EVERDALE OUTFALL ON EAST SIDE OF THOMPSON CREEK

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
14.6	3	18.4	2
14.7	3	18.5	2
14.8	3	18.6	2
14.9	3	18.7	2
15.0	3	18.8	2
15.1	3	18.9	2
15.2	3	19.0	2
15.3	3	19.1	2
15.4	3	19.2	2
15.5	3	19.3	2
15.6	2	19.4	2
15.7	2	19.5	2
15.8	2	19.6	2
15.9	2	19.7	2
16.0	2	19.8	2
16.1	2	19.9	2
16.2	2	20.0	2
16.3	2	20.1	2
16.4	2	20.2	2
16.5	2	20.3	2
16.6	2	20.4	2
16.7	2	20.5	2
16.8	2	20.6	2
16.9	2	20.7	2
17.0	2	20.8	2
17.1	2	20.9	2
17.2	2	21.0	2
17.3	2	21.1	2
17.4	2	21.2	2
17.5	2	21.3	2
17.6	2	21.4	2
17.7	2	21.5	2
17.8	2	21.6	2
17.9	2	21.7	2
18.0	2	21.8	2
18.1	2	21.9	2
18.2	2		
18.3	2		

100-YR HYDROGRAPH -- EVERDALE DR - SYSTEM #2



SYSTEM #3

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-14-1993 03:20:00
Watershed file: --> SYSTEM3 .WSD
Hydrograph file: --> SYSTEM3 .HYD

SYSTEM 3
THOMPSON CREEK AT PETTIGREW CT WEST SIDE
STORM SYSTEM NOT FUNCTIONING

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
RESIDENTIAL	38.00	75.0	0.40	0.00	3.95	1.63	.17 .10

* Travel time from subarea outfall to composite watershed outfall point.
Total area = 38.00 acres or 0.05937 sq.mi
Peak discharge = 13 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea cription	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
RESIDENTIAL	0.35	0.00	0.40	0.00	No	--

* Travel time from subarea outfall to composite watershed outfall point.

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-14-1993 03:20:00
Watershed file: --> SYSTEM3 .WSD
Hydrograph file: --> SYSTEM3 .HYD

SYSTEM 3
THOMPSON CREEK AT PETTIGREW CT WEST SIDE
STORM SYSTEM NOT FUNCTIONING

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
RESIDENTIAL	13	8.2
Composite Watershed	13	8.2

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-14-1993 03:20:00
Watershed file: --> SYSTEM3 .WSD
Hydrograph file: --> SYSTEM3 .HYD

SYSTEM 3
THOMPSON CREEK AT PETTIGREW CT WEST SIDE
STORM SYSTEM NOT FUNCTIONING

Composite Hydrograph Summary (cfs)

Subarea Description	7.0 hr	7.3 hr	7.6 hr	7.9 hr	8.0 hr	8.1 hr	8.2 hr	8.3 hr	8.4 hr
RESIDENTIAL	3	3	4	6	9	11	13	13	13
Total (cfs)	3	3	4	6	9	11	13	13	13

Subarea Description	8.5 hr	8.6 hr	8.7 hr	8.8 hr	9.0 hr	9.2 hr	9.4 hr	9.6 hr	9.8 hr
RESIDENTIAL	12	10	9	8	7	6	6	5	5
Total (cfs)	12	10	9	8	7	6	6	5	5

Subarea Description	10.0 hr	10.3 hr	10.6 hr	11.0 hr	11.5 hr	12.0 hr	12.5 hr	13.0 hr	13.5 hr
RESIDENTIAL	4	4	4	4	4	3	3	3	3
Total (cfs)	4	4	4	4	4	3	3	3	3

Subarea Description	14.0 hr	15.0 hr	16.0 hr	18.0 hr	22.0 hr
RESIDENTIAL	3	3	3	3	2
Total (cfs)	3	3	3	3	2

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-14-1993 03:20:00
Watershed file: --> SYSTEM3 .WSD
Hydrograph file: --> SYSTEM3 .HYD

SYSTEM 3
THOMPSON CREEK AT PETTIGREW CT WEST SIDE
STORM SYSTEM NOT FUNCTIONING

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
7.0	3	10.8	4
7.1	3	10.9	4
7.2	3	11.0	4
7.3	3	11.1	4
7.4	3	11.2	4
7.5	4	11.3	4
7.6	4	11.4	4
7.7	5	11.5	4
7.8	5	11.6	4
7.9	6	11.7	4
8.0	9	11.8	3
8.1	11	11.9	3
8.2	13	12.0	3
8.3	13	12.1	3
8.4	13	12.2	3
8.5	12	12.3	3
8.6	10	12.4	3
8.7	9	12.5	3
8.8	8	12.6	3
8.9	7	12.7	3
9.0	7	12.8	3
9.1	6	12.9	3
9.2	6	13.0	3
9.3	6	13.1	3
9.4	6	13.2	3
9.5	6	13.3	3
9.6	5	13.4	3
9.7	5	13.5	3
9.8	5	13.6	3
9.9	4	13.7	3
10.0	4	13.8	3
10.1	4	13.9	3
10.2	4	14.0	3
10.3	4	14.1	3
10.4	4	14.2	3
10.5	4	14.3	3
10.6	4	14.4	3
10.7	4	14.5	3

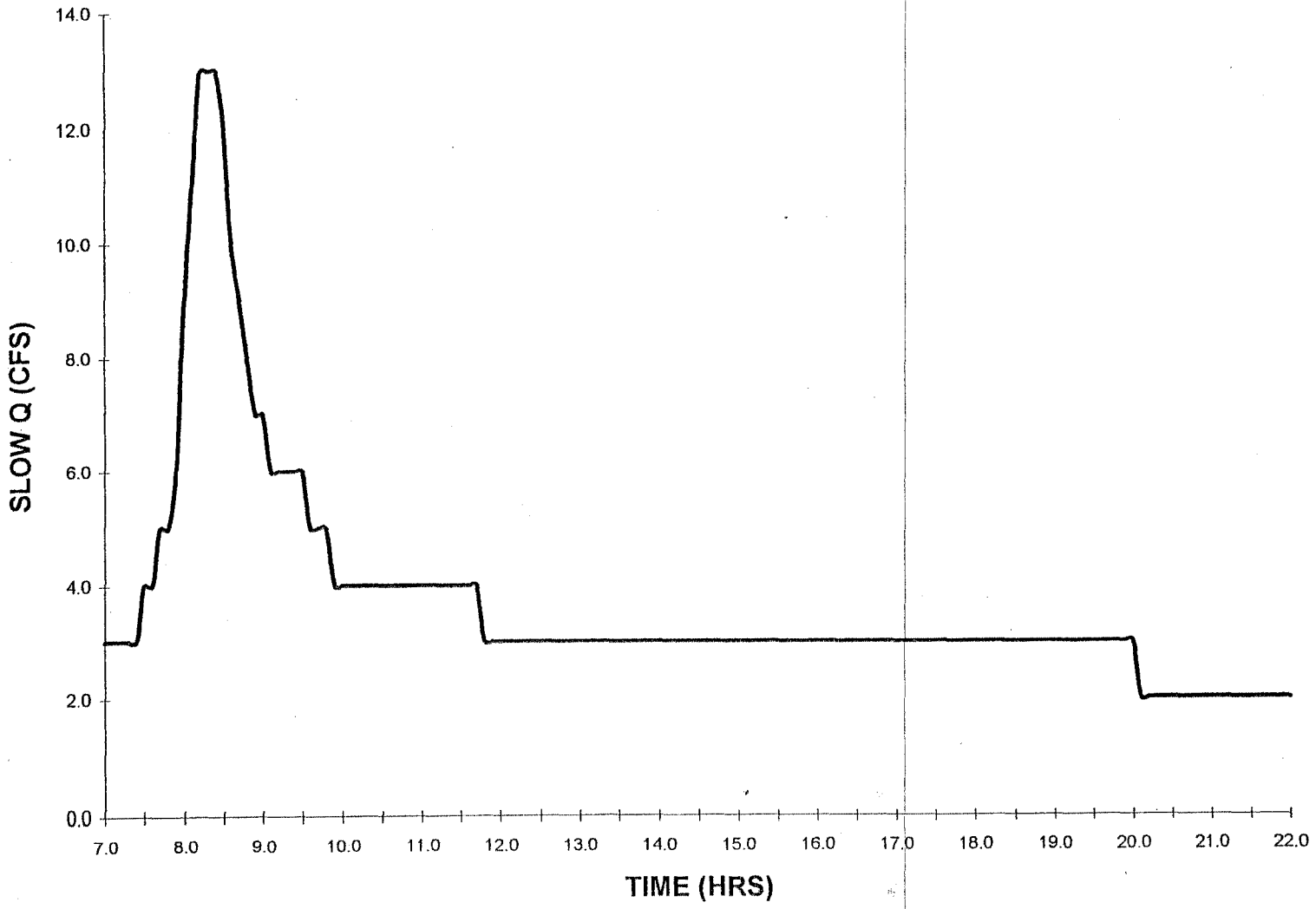
TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-14-1993 03:20:00
Watershed file: --> SYSTEM3 .WSD
Hydrograph file: --> SYSTEM3 .HYD

SYSTEM 3
THOMPSON CREEK AT PETTIGREW CT WEST SIDE
STORM SYSTEM NOT FUNCTIONING

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
14.6	3	18.4	3
14.7	3	18.5	3
14.8	3	18.6	3
14.9	3	18.7	3
15.0	3	18.8	3
15.1	3	18.9	3
15.2	3	19.0	3
15.3	3	19.1	3
15.4	3	19.2	3
15.5	3	19.3	3
15.6	3	19.4	3
15.7	3	19.5	3
15.8	3	19.6	3
15.9	3	19.7	3
16.0	3	19.8	3
16.1	3	19.9	3
16.2	3	20.0	3
16.3	3	20.1	2
16.4	3	20.2	2
16.5	3	20.3	2
16.6	3	20.4	2
16.7	3	20.5	2
16.8	3	20.6	2
16.9	3	20.7	2
17.0	3	20.8	2
17.1	3	20.9	2
17.2	3	21.0	2
17.3	3	21.1	2
17.4	3	21.2	2
17.5	3	21.3	2
17.6	3	21.4	2
17.7	3	21.5	2
17.8	3	21.6	2
17.9	3	21.7	2
18.0	3	21.8	2
18.1	3	21.9	2
18.2	3		
18.3	3		

100-YR HYDROGRAPH -- PETTIGREW CT - SYSTEM #3



APPENDIX C

SYSTEM #4

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-13-1993 22:38:32
Watershed file: --> SYSTEM4 .WSD
Hydrograph file: --> SYSTEM4 .HYD

THOMPSON CREEK ALONG GAVILAN DR
WITHOUT RUN OVER FROM SYSTEM 1 & 2

>>>> Input Parameters Used to Compute Hydrograph <<<<

Subarea Description	AREA (acres)	CN	Tc (hrs)	* Tt (hrs)	Precip. (in)	Runoff (in)	Ia/p input/used
RESIDENTIAL	145.00	75.0	0.50	0.00	3.95	1.63	.17 .10

* Travel time from subarea outfall to composite watershed outfall point.
Total area = 145.00 acres or 0.2266 sq.mi
Peak discharge = 48 cfs

>>>> Computer Modifications of Input Parameters <<<<<

Subarea Description	Input Values Tc (hr)	* Tt (hr)	Rounded Values Tc (hr)	* Tt (hr)	Ia/p Interpolated (Yes/No)	Ia/p Messages
RESIDENTIAL	0.53	0.00	0.50	0.00	No	--

* Travel time from subarea outfall to composite watershed outfall point.

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-13-1993 22:38:32
Watershed file: --> SYSTEM4 .WSD
Hydrograph file: --> SYSTEM4 .HYD

THOMPSON CREEK ALONG GAVILAN DR
WITHOUT RUN OVER FROM SYSTEM 1 & 2

>>>> Summary of Subarea Times to Peak <<<<

Subarea	Peak Discharge at Composite Outfall (cfs)	Time to Peak at Composite Outfall (hrs)
RESIDENTIAL	48	8.3
Composite Watershed	48	8.3

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-13-1993 22:38:32
Watershed file: --> SYSTEM4 .WSD
Hydrograph file: --> SYSTEM4 .HYD

THOMPSON CREEK ALONG GAVILAN DR
WITHOUT RUN OVER FROM SYSTEM 1 & 2

Composite Hydrograph Summary (cfs)

Subarea Description	7.0 hr	7.3 hr	7.6 hr	7.9 hr	8.0 hr	8.1 hr	8.2 hr	8.3 hr	8.4 hr
RESIDENTIAL	9	10	13	20	27	35	42	48	48
Total (cfs)	9	10	13	20	27	35	42	48	48

Subarea Description	8.5 hr	8.6 hr	8.7 hr	8.8 hr	9.0 hr	9.2 hr	9.4 hr	9.6 hr	9.8 hr
RESIDENTIAL	48	43	38	34	28	25	23	20	18
Total (cfs)	48	43	38	34	28	25	23	20	18

Subarea Description	10.0 hr	10.3 hr	10.6 hr	11.0 hr	11.5 hr	12.0 hr	12.5 hr	13.0 hr	13.5 hr
RESIDENTIAL	17	16	16	15	14	13	12	12	12
Total (cfs)	17	16	16	15	14	13	12	12	12

Subarea Description	14.0 hr	15.0 hr	16.0 hr	18.0 hr	22.0 hr
RESIDENTIAL	11	11	11	10	8
Total (cfs)	11	11	11	10	8

TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-13-1993 22:38:32
Watershed file: --> SYSTEM4 .WSD
Hydrograph file: --> SYSTEM4 .HYD

THOMPSON CREEK ALONG GAVILAN DR
WITHOUT RUN OVER FROM SYSTEM 1 & 2

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
7.0	9	10.8	15
7.1	9	10.9	15
7.2	10	11.0	15
7.3	10	11.1	15
7.4	11	11.2	15
7.5	12	11.3	14
7.6	13	11.4	14
7.7	15	11.5	14
7.8	18	11.6	14
7.9	20	11.7	14
8.0	27	11.8	13
8.1	35	11.9	13
8.2	42	12.0	13
8.3	48	12.1	13
8.4	48	12.2	13
8.5	48	12.3	12
8.6	43	12.4	12
8.7	38	12.5	12
8.8	34	12.6	12
8.9	31	12.7	12
9.0	28	12.8	12
9.1	26	12.9	12
9.2	25	13.0	12
9.3	24	13.1	12
9.4	23	13.2	12
9.5	22	13.3	12
9.6	20	13.4	12
9.7	19	13.5	12
9.8	18	13.6	12
9.9	18	13.7	12
10.0	17	13.8	11
10.1	17	13.9	11
10.2	16	14.0	11
10.3	16	14.1	11
10.4	16	14.2	11
10.5	16	14.3	11
10.6	16	14.4	11
10.7	16	14.5	11

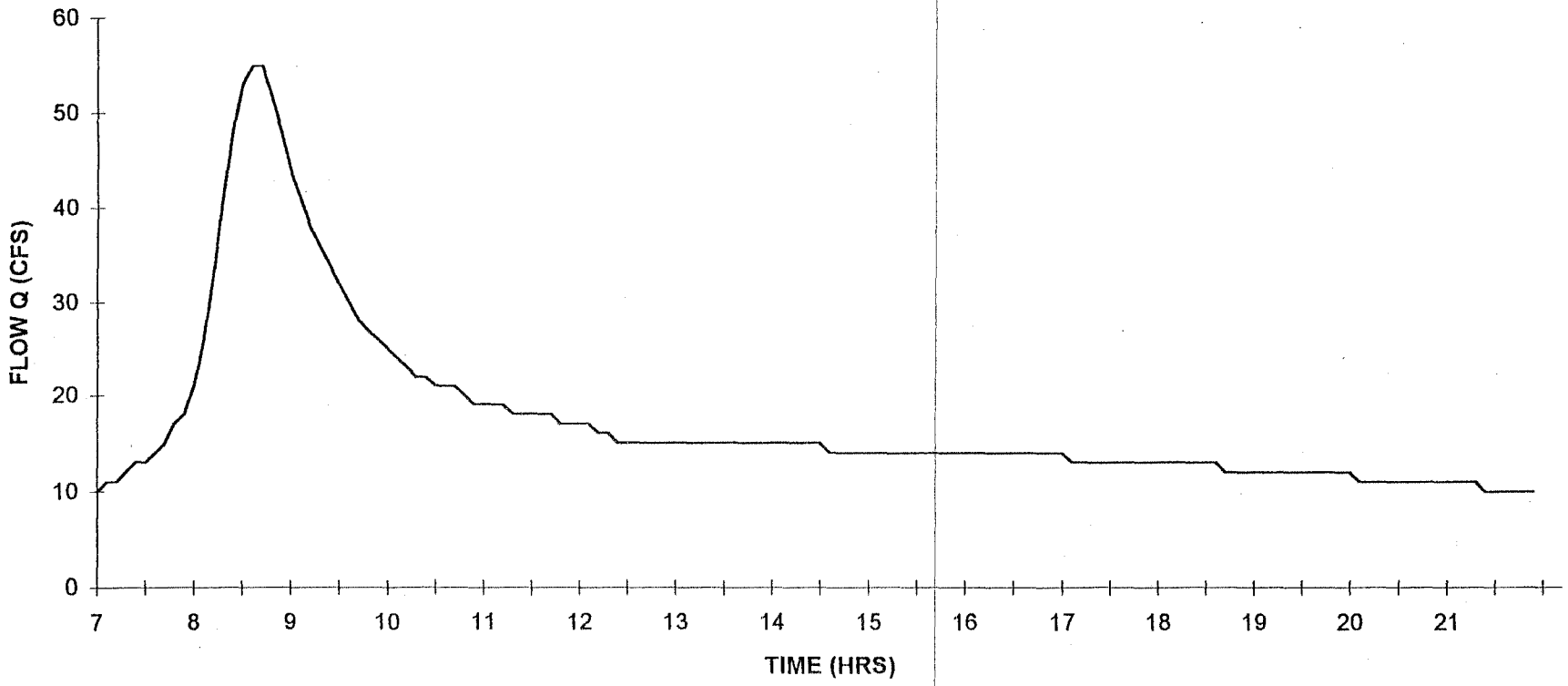
TR-55 TABULAR HYDROGRAPH METHOD
Type IA Distribution
(24 hr. Duration Storm)

Executed: 12-13-1993 22:38:32
Watershed file: --> SYSTEM4 .WSD
Hydrograph file: --> SYSTEM4 .HYD

THOMPSON CREEK ALONG GAVILAN DR
WITHOUT RUN OVER FROM SYSTEM 1 & 2

Time (hrs)	Flow (cfs)	Time (hrs)	Flow (cfs)
14.6	11	18.4	10
14.7	11	18.5	10
14.8	11	18.6	10
14.9	11	18.7	10
15.0	11	18.8	10
15.1	11	18.9	10
15.2	11	19.0	10
15.3	11	19.1	9
15.4	11	19.2	9
15.5	11	19.3	9
15.6	11	19.4	9
15.7	11	19.5	9
15.8	11	19.6	9
15.9	11	19.7	9
16.0	11	19.8	9
16.1	11	19.9	9
16.2	11	20.0	9
16.3	11	20.1	9
16.4	11	20.2	9
16.5	11	20.3	9
16.6	11	20.4	9
16.7	11	20.5	9
16.8	11	20.6	9
16.9	11	20.7	9
17.0	11	20.8	9
17.1	10	20.9	9
17.2	10	21.0	9
17.3	10	21.1	8
17.4	10	21.2	8
17.5	10	21.3	8
17.6	10	21.4	8
17.7	10	21.5	8
17.8	10	21.6	8
17.9	10	21.7	8
18.0	10	21.8	8
18.1	10	21.9	8
18.2	10		
18.3	10		

100-YR HYDROGRAPH -- SCOTTSDALE DR
SYSTEM#4



APPENDIX C

APPENDIX D

EXISTING STORM DRAINAGE SYSTEM ANALYSIS

RELEASE PT

RELEASE PT

RELEASE PT

System 2

System 3

System 1

WATERSHED # 2

WATERSHED # 1

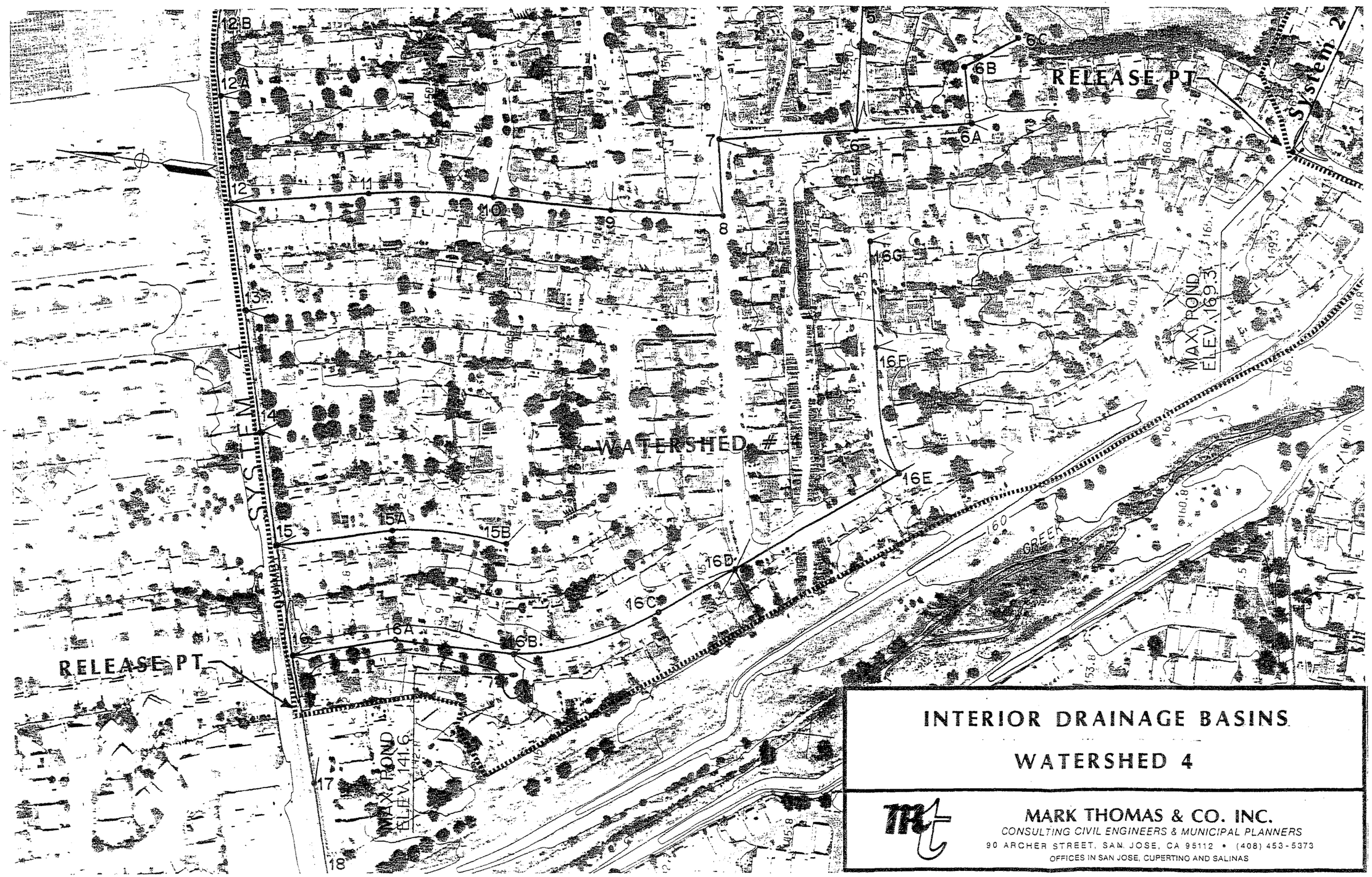
WATERSHED # 3

THOMPSON

INTERIOR DRAINAGE BASINS

WATERSHEDS 1,2 &3

MARK THOMAS & CO. INC.
CONSULTING CIVIL ENGINEERS & MUNICIPAL PLANNERS
90 ARCHER STREET, SAN JOSE, CA 95112 • (408) 453-5373
OFFICES IN SAN JOSE, CUPERTINO AND SALINAS



INTERIOR DRAINAGE BASINS

WATERSHED 4

MARK THOMAS & CO. INC.
CONSULTING CIVIL ENGINEERS & MUNICIPAL PLANNERS
90 ARCHER STREET, SAN JOSE, CA 95112 • (408) 453-5373
OFFICES IN SAN JOSE, CUPERTINO AND SALINAS

FILE NAME: C:\BASIC\BASDATA\so1f1.STM DATE: 07-18-1990
4:02:54

TANT K1= 0.74 (1)
TANT N= 0.521

Sample Computer Printout

```
**********************************************************
*                                                        *
*                    STORM ANALYSIS                      *
*                MARK THOMAS & CO. INC.                  *
*                   90 Archer Street                     *
*                San Jose, California 95112              *
*                                                        *
**********************************************************
```

o1-80
ANNUAL PRECIPITATION 27 INCHES
GN STORM 10 YEARS

E (2) FROM	TO	(3) AREA ACRES	(4) COEF K	(5) KA	(6) KA (TOT)	(7) TC MIN.	(8) I IN/HR	(9) Q CFS	(10) CAL SIZE IN.	(11) DESIGN SIZE IN.	(12) SLOPE FT/FT	(13) LEN FT.	(14) VEL FPS	(15) TF MIN.	(16) IN IN.	(17) EXIST PIPE FT/FT	(18) CFS	(19) EXCESS Q CFS	(20) HGL D-IN	(21) OVER PIPE
3	4	2.68	0.66	1.77	1.8	10.0	1.88	3.3	13.0	15	.0066	104	3.62	0.5	24	.0066	18.4			
4	5	0.00	0.00	0.00	1.8	10.5	1.84	3.2	17.4	18	.0013	140	1.96	1.2						
5a	5b	2.11	0.72	1.52	1.5	10.0	1.88	2.9	11.3	12	.0100	60	4.07	0.2	18	.0100	9.1			
5b	5	0.00	0.00	0.00	1.5	10.2	1.86	2.8	12.4	15	.0060	130	3.35	0.6						
5c	5d	2.00	0.30	0.60	0.6	11.7	1.74	1.0	8.8	10	.0050	60	2.44	0.4	18	.0050	6.4			
5d	5g	0.00	0.00	0.00	0.6	12.1	1.71	1.0	9.9	10	.0026	380	1.90	3.3						
5e	5f	8.00	0.30	2.40	2.4	20.0	1.31	3.1	14.7	15	.0031	64	2.69	0.4						
5f	5g	0.00	0.00	0.00	2.4	20.4	1.30	3.1	12.4	15	.0073	110	3.70	0.5						
5g	5h	3.21	0.63	2.02	5.0	20.9	1.28	6.4	20.1	21	.0024	82	2.92	0.5						
5h	5	0.00	0.00	0.00	5.0	21.4	1.27	6.4	20.5	21	.0016	200	2.79	1.2						
5	6	1.25	0.58	0.72	9.0	22.6	1.23	11.1	20.1	21	.0072	130	5.06	0.4						
6	7	0.85	0.45	0.38	9.4	23.0	1.22	11.5	20.3	21	.0072	105	5.10	0.3						

L AREA ANALYZED 20.1 ACRES

APPENDIX D-1

Explanation of Printout

APPENDIX A

Explanation of Output of "Storm Analysis"

See attached typical output sheet

Item	Description
1.	Coefficients K1 and N for determining rate of rainfall in the following relationship: $I=\frac{K1}{T_C^N}$ Where I = Rate of rainfall in inches/hour, T_C = Time of concentration in hours (see attached analyses for derivation of K1 and N)
2.	Nodes used in analyzing tributary flow areas, as delineated in exhibits of study area.
3.	Area tributary to the "From" node, measured in acres.
4.	Runoff coefficient as described in Drainage Report. Coefficient is prorated, based on runoff coefficents of individual subareas.
5.	Product of items 3 and 4.
6.	Running total of item 5 as relates to drainage element being analyzed.
7.	Time of concentration in minutes. (Minimum time of concentration is 10 minutes).
8.	Rate of rainfall in inches per hour.
9.	Flowrate in cubic feet per second.
*10.	Calculated theoretical pipe size (circular pipe) to convey Q, given the existing pipe slope. Assumes n = 0.015 when d < 21 inches and n = 0.013 when d > 21 inches.
*11.	Suggested pipe size in inches based on 10.
12.	Existing or proposed slope in feet per foot.
13.	Length from node to node along flow route in feet.
14.	Full pipe velocity in feet per second for computation of travel time to next node.
15.	Travel time in minutes to next mode using 13 and 14.
*16.	Diameter of existing pipe in inches. Assumes n = 0.015 for pipes under 21 inches, and n = 0.013 for pipes 21 inches and greater. Enter equivalent size of RCP pipe when another material and/or shape is used.

17. Slope of existing pipe in feet per foot.

18. Capacity of existing pipe without surcharge.

19. Additional flow to be conveyed if existing pipe isn't surcharged.

*20. Size of parallel pipe to convey flow noted in 19 without surcharging, using the slope from 17.

*21. Surcharging of existing pipe in feet if no new or parallel facilities are constructed, using Manning's friction slope.

*For the purposes of design, individual pipes are analyzed separately using the "Culvert Calculation" form No. 4ES425 (7/73)

TA FILE NAME: C:\DATA\BASDATA\system1.STM DATE: 12-07-1993 TIME: 23:12:32

NSTANT K= 1.28
NSTANT N= 0.631
JUSTMENT FACTOR = 1

SYSTEM #1

****
*
* STORM ANALYSIS
* MARK THOMAS & CO. INC.
* 90 Archer Street
* San Jose, California 95112
*
****

OMPSON CREEK OUTFALL AT WESTGROVE LN
AN ANNUAL PRECIPITATION 14.7 INCHES
SIGN STORM 100 YEARS
BMERGED OUTFALL CONDITION AT 7 FEET

LINE NO.	MANHOLE FROM	TO	AREA ACRES	COEF	CA	SAC	TC MIN.	I IN/HR	Q CFS	CAL SIZE IN.	DESIGN SIZE IN.	SLOPE %	LEN FT.	VEL FPS	TF MIN.	IN IN.	EXIST PIPE %	EXIST PIPE CFS	EXCESS Q CFS	HGL D-IN	OVER PIPE
1	1	2	4.00	0.45	1.80	1.8	10.0	3.95	7.1	13.1	15	2.83	40	7.55	0.1	10	2.83	3.2	3.9	10.5	39.1
2	2	3	0.00	0.45	0.00	1.8	10.1	3.93	7.1	18.0	21	0.52	584	4.00	2.4	12	0.52	2.2	4.8	15.6	34.6

TAL AREA ANALYZED 4 ACRES

APPENDIX D-2

ATA FILE NAME: C:\DATA\BASDATA\SYSTEM2.STM DATE: 12-07-1993 TIME: 23:34:48

ONSTANT K= 1.28
ONSTANT N= 0.631
JUSTMENT FACTOR = 1

SYSTEM #2

****
*
* STORM ANALYSIS
* MARK THOMAS & CO. INC.
* 90 Archer Street
* San Jose, California 95112
*
****

HOMPSON CREEK OUTFALL AT WESTBRANCH DR
EAN ANNUAL PRECIPITATION 14.7 INCHES
ESIGN STORM 100 YEARS
JBMERGED OUTFALL CONDITION AT 5.8 FEET

LINE NO.	MANHOLE FROM	TO	AREA ACRES	COEF	CA	SAC	TC MIN.	I IN/HR	Q CFS	CAL SIZE IN.	DESIGN SIZE IN.	SLOPE %	LEN FT.	VEL FPS	TF MIN.	IN	EXIST PIPE SLOPE %	EXIST PIPE CFS	EXCESS Q CFS	HGL D-IN	OVER PIPE
1	1	2	2.08	0.45	0.94	0.9	10.0	3.95	3.7	12.2	15	1.16	378	4.59	1.4	12	1.16	3.3	0.4	5.1	%125.8
2	2	3	5.80	0.45	2.61	3.5	11.4	3.64	12.9	20.7	21	0.62	386	5.52	1.2	18	0.62	7.2	5.7	16.1	%124.7
3	3	4	8.73	0.45	3.93	7.5	12.5	3.42	25.6	28.4	30	0.45	172	5.81	0.5	18	0.45	6.1	19.5	25.7	%119.4
4	4	5	0.00	0.45	0.00	7.5	13.0	3.34	25.0	34.6	36	0.15	123	3.83	0.5	18	0.15	3.5	21.5	32.7	%106.6
5	5	6	2.10	0.45	0.94	8.4	13.6	3.26	27.4	30.3	33	0.37	123	5.50	0.4	18	0.37	5.5	21.9	27.8	97.5
6	6	7	1.40	0.45	0.63	9.0	13.9	3.20	29.0	33.2	36	0.25	122	4.81	0.4	18	0.25	4.6	24.4	31.2	86.8
7	7	8	6.21	0.45	2.79	11.8	14.4	3.14	37.2	34.5	36	0.34	387	5.75	1.1	18	0.34	5.3	31.9	32.5	74.7
8	8	9	2.19	0.45	0.99	12.8	15.5	3.00	38.5	37.2	39	0.24	268	5.08	0.9	24	0.24	11.1	27.4	32.8	11.3
9	9	10	4.85	0.45	2.18	15.0	16.4	2.89	43.5	34.7	36	0.45	130	6.64	0.3	24	0.45	15.2	28.3	29.5	12.9
10	10	11	0.00	0.45	0.00	15.0	16.7	2.86	42.9	38.2	39	0.26	88	5.38	0.3	24	0.26	11.5	31.4	34.0	8.7

OTAL AREA ANALYZED 33.36 ACRES

TA FILE NAME: C:\DATA\BASDATA\SYSTEM3.STM DATE: 12-08-1993 TIME: 01:26:54

NSTANT K= 1.28
NSTANT N= 0.631
JUSTMENT FACTOR = 1

SYSTEM #3

****
*
* STORM ANALYSIS
* MARK THOMAS & CO. INC.
* 90 Archer Street
* San Jose, California 95112
*
****

OMPSON CREEK OUTFALL AT PETIGREW CT
AN ANNUAL PRECIPITATION 14.7 INCHES
SIGN STORM 100 YEARS
BMERGED OUTFALL CONDITION AT 6.2 FEET

LINE NO.	MANHOLE FROM	TO	AREA ACRES	COEF	CA	SAC	TC MIN.	I IN/HR	Q CFS	CAL SIZE IN.	DESIGN SIZE IN.	SLOPE %	LEN FT.	VEL FPS	TF MIN.	IN	EXIST PIPE %	EXIST PIPE CFS	EXCESS Q CFS	HGL D-IN	OVER PIPE
1	1	2	3.07	0.45	1.38	1.4	10.0	3.95	5.5	13.3	15	1.54	291	5.63	0.9	12	1.54	3.8	1.6	8.5	%219.1
2	2	3	4.75	0.45	2.14	3.5	10.9	3.75	13.2	20.6	21	0.66	264	5.69	0.8	12	0.66	2.5	10.7	20.1	%214.5
3	3	4	4.44	0.45	2.00	5.5	11.6	3.59	19.8	21.5	24	1.19	218	7.85	0.5	12	1.19	3.4	16.4	20.1	%168.0
4	4	5	1.28	0.45	0.58	6.1	12.1	3.50	21.3	21.6	24	1.35	258	8.39	0.5	18	1.35	10.6	10.8	17.6	81.0
5	5	6	7.72	0.45	3.47	9.6	12.6	3.41	32.6	25.7	27	1.26	234	9.09	0.4	18	1.26	10.2	22.4	22.3	70.3
6	6	7	3.10	0.45	1.39	11.0	13.0	3.34	36.6	27.7	30	1.05	255	8.73	0.5	24	1.05	23.2	13.4	20.1	43.1
7	7C	7B	2.55	0.45	1.15	1.1	10.0	3.95	4.5	12.7	15	1.38	168	5.16	0.5	12	1.38	3.6	0.9	6.9	56.8
8	7B	7A	0.00	0.45	0.00	1.1	10.5	3.82	4.4	12.8	15	1.25	164	4.93	0.6	12	1.25	3.5	0.9	7.1	55.5
9	7A	7	2.76	0.45	1.24	2.4	11.1	3.70	8.8	15.1	18	2.09	247	7.12	0.6	12	2.09	4.5	4.4	11.6	54.2
10	7	8	5.31	0.45	2.39	15.7	13.5	3.26	51.4	36.3	39	0.49	351	7.14	0.8	24	0.49	15.8	35.5	31.6	39.1
11	8	9	0.00	0.45	0.00	15.7	14.3	3.15	49.5	43.2	45	0.18	251	4.86	0.9	24	0.18	9.6	39.9	39.9	22.8
12	9	10	0.76	0.45	0.34	16.1	15.2	3.03	48.8	38.8	39	0.31	258	5.94	0.7	24	0.31	12.6	36.2	34.7	19.4
13	10	11	2.32	0.45	1.04	17.1	15.9	2.94	50.4	30.2	33	1.26	55	10.13	0.1	24	1.26	25.4	25.0	23.2	8.2

OTAL AREA ANALYZED 38.06 ACRES

APPENDIX D-2

TA FILE NAME: C..._ATA\BASDATA\SYSTEM4.STM DATE: 13-1993 TIME: 22:05:28

NSTANT K= 1.28
NSTANT N= 0.631
JUSTMENT FACTOR = 1

SYSTEM #4

****
*
* STORM ANALYSIS
* MARK THOMAS & CO. INC.
* 90 Archer Street
* San Jose, California 95112
*
****

IOMPSON CREEK SUB SYSTEM ALONG SCOTTSDALE DR
:AN ANNUAL PRECIPITATION 14.7 INCHES
:SIGN STORM 100 YEARS
)BMERGED OUTFALL CONDITION AT 2 FEET

LINE NO.	MANHOLE FROM	TO	AREA ACRES	COEF	CA	SAC	TC MIN.	I IN/HR	Q CFS	CAL SIZE IN.	DESIGN SIZE IN.	SLOPE %	LEN FT.	VEL FPS	TF MIN.	IN	EXIST PIPE %	CFS	EXCESS Q CFS	HGL D-IN	OVER PIPE
1	1	2	1.41	0.45	0.63	0.6	10.0	3.95	2.5	10.8	12	1.00	256	3.94	1.1	10	1.00	1.9	0.6	6.3	%434.3
2	2	3	1.25	0.45	0.56	1.2	11.1	3.70	4.4	13.1	15	1.12	267	4.74	0.9	10	1.12	2.0	2.4	10.4	%432.4
3	3	4	6.34	0.45	2.85	4.1	12.0	3.52	14.2	19.3	21	1.47	260	7.03	0.6	12	1.47	3.7	10.5	17.2	%420.9
4	4	5	5.28	0.45	2.38	6.4	12.6	3.41	21.9	23.2	24	0.98	325	7.48	0.7	15	0.98	5.5	16.4	20.8	%369.4
5	5	6	1.24	0.45	0.56	7.0	13.4	3.29	23.0	22.6	24	1.22	410	8.22	0.8	15	1.22	6.2	16.8	20.1	%322.9
6	6C	6B	6.53	0.30	1.96	2.0	15.0	3.06	6.0	16.6	18	0.57	143	3.97	0.6	12	0.57	2.3	3.7	13.8	%301.7
7	6B	6A	0.00	0.00	0.00	2.0	15.6	2.98	5.8	16.8	18	0.52	133	3.81	0.6	12	0.52	2.2	3.6	14.0	%297.1
8	6A	6	4.54	0.45	2.04	4.0	16.2	2.91	11.7	16.9	18	1.98	278	7.48	0.6	12	1.98	4.3	7.3	14.2	%293.0
9	6	7	5.46	0.45	2.46	13.4	16.8	2.85	38.3	28.9	30	0.92	355	8.40	0.7	18	0.92	8.7	29.5	26.2	%258.9
10	7	8	10.59	0.38	4.02	17.5	17.5	2.77	48.5	32.0	33	0.85	185	8.65	0.4	21	0.85	14.6	33.8	28.0	%199.4
11	8	9	2.45	0.45	1.10	18.6	17.9	2.74	50.9	34.3	36	0.65	260	7.92	0.5	21	0.65	12.8	38.1	30.8	%183.7
12	9	10	2.13	0.45	0.96	19.5	18.4	2.69	52.5	34.2	36	0.70	282	8.21	0.6	21	0.70	13.3	39.2	30.7	%158.6
13	10	11	3.04	0.45	1.37	20.9	19.0	2.64	55.1	34.4	36	0.75	315	8.53	0.6	21	0.75	13.7	41.4	30.9	%129.6
14	11	12	6.40	0.45	2.88	23.8	19.6	2.58	61.4	41.1	42	0.36	322	6.65	0.8	24	0.36	13.6	47.8	37.5	93.9
15	12D	12C	9.32	0.65	6.06	6.1	15.0	3.06	18.5	21.3	24	1.10	388	7.50	0.9	21	1.10	16.6	1.9	9.6	98.9
16	12C	12B	6.32	0.45	2.84	8.9	15.9	2.95	26.3	24.3	27	1.10	285	8.18	0.6	21	1.10	16.6	9.7	17.6	97.9
17	12B	12A	5.64	0.45	2.54	11.4	16.4	2.89	33.0	27.7	30	0.85	300	7.86	0.6	21	0.85	14.6	18.4	22.3	93.2
18	12A	12	3.45	0.45	1.55	13.0	17.1	2.82	36.6	28.7	30	0.88	254	8.17	0.5	21	0.88	14.9	21.7	23.6	82.7
19	12	13	6.40	0.45	2.88	39.6	20.4	2.52	99.8	42.8	45	0.77	250	9.99	0.4	27	0.77	27.2	72.7	38.0	71.4
20	13	14	6.43	0.45	2.89	42.5	20.8	2.49	105.8	52.9	54	0.28	304	6.94	0.7	33	0.28	28.0	77.8	47.1	47.3
21	14	15	3.13	0.45	1.41	44.0	21.6	2.43	106.9	52.7	54	0.29	281	7.05	0.7	33	0.29	28.5	78.4	47.0	36.0
22	15A	15	2.55	0.45	1.15	1.1	10.0	3.95	4.5	15.4	18	0.50	553	3.52	2.6	12	0.50	2.2	2.3	12.0	34.5
23	15	16	7.18	0.45	3.23	48.3	22.2	2.39	115.3	53.6	54	0.31	225	7.36	0.5	33	0.31	29.4	85.9	48.0	25.3
24	16G	16F	6.27	0.45	2.82	2.8	10.0	3.95	11.1	21.3	24	0.40	260	4.52	1.0	12	0.40	2.0	9.2	20.9	%862.7
25	16F	16E	3.10	0.45	1.39	4.2	11.0	3.73	15.7	19.8	21	1.56	301	7.37	0.7	12	1.56	3.9	11.9	17.8	%829.9
26	16E	16D	8.00	0.45	3.60	7.8	11.6	3.59	28.0	24.4	27	1.21	453	8.62	0.9	15	1.21	6.2	21.9	22.3	%756.6
27	16D	16C	10.30	0.45	4.64	12.5	12.5	3.43	42.7	27.6	30	1.47	282	10.30	0.5	15	1.47	6.8	35.9	25.8	%648.3

28	16C	16B	0.00	0.00	0.00	12.5	13.0	3.35	41.7	31.4	33	0.70	301	...5	0.6	15	0.70	4.7	37.0	30.0	%488.6
29	16B	16A	1.96	0.45	0.88	13.3	13.6	3.25	43.3	31.9	33	0.70	270	7.83	0.6	15	0.70	4.7	38.6	30.5	%323.4
30	16A	16	0.00	0.00	0.00	13.3	14.2	3.17	42.2	31.6	33	0.70	264	7.77	0.6	15	0.70	4.7	37.5	30.2	%163.6
31	16	17	5.44	0.45	2.45	64.1	22.7	2.35	150.8	63.2	66	0.22	313	6.92	0.8	36	0.22	31.3	119.5	57.9	27.1
32	17	18	2.90	0.45	1.31	65.4	23.5	2.30	150.8	63.2	66	0.22	200	6.92	0.5	36	0.22	31.3	119.5	57.9	11.8

TAL AREA ANALYZED 145.05 ACRES

APPENDIX E

INTERIOR BASIN STORM RUNOFF STORAGE AREA

		POND ANALYSIS AT PETTIGREW CT					
		STORM SYSTEM 3					
TIME (HRS)	Q (CFS)	SYSTEM CAPACITY (CFS)	EXCESS Q (CFS)	EXCESS VOLUME (CF)	OVERFLOW RELEASE (CFS) *	AVAILABLE STORAGE (CF)	STORAGE VOLUME (CF) **
7.00	3	0	3	0	0	11000	0
7.10	3	0	3	1080	0	9920	1080
7.20	3	0	3	1080	0	8840	2160
7.30	3	0	3	1080	0	7760	3240
7.40	3	0	3	1080	0	6680	4320
7.50	4	0	4	1260	0	5420	5580
7.60	4	0	4	1440	0	3980	7020
7.70	5	0	5	1620	0	2360	8640
7.80	5	0	5	1800	0	560	10440
7.90	6	0	6	1980	6	0	11000
8.00	9	0	9	2700	9	0	11000
8.10	11	0	11	3600	11	0	11000
8.20	13	0	13	4320	13	0	11000
8.30	13	0	13	4680	13	0	11000
8.40	13	0	13	4680	13	0	11000
8.50	12	0	12	4500	12	0	11000
8.60	10	0	10	3960	10	0	11000
8.70	9	0	9	3420	9	0	11000
8.80	8	0	8	3060	8	0	11000
8.90	7	0	7	2700	7	0	11000
9.00	7	0	7	2520	7	0	11000
9.10	6	0	6	2340	6	0	11000
9.20	6	0	6	2160	6	0	11000
9.30	6	0	6	2160	6	0	11000
9.40	6	0	6	2160	6	0	11000
9.50	6	0	6	2160	6	0	11000
9.60	5	0	5	1980	5	0	11000
9.70	5	0	5	1800	5	0	11000
9.80	5	0	5	1800	5	0	11000
9.90	4	0	4	1620	4	0	11000
10.00	4	0	4	1440	4	0	11000
10.10	4	0	4	1440	4	0	11000
10.20	4	0	4	1440	4	0	11000
10.30	4	0	4	1440	4	0	11000
10.40	4	0	4	1440	4	0	11000
10.50	4	0	4	1440	4	0	11000
10.60	4	0	4	1440	4	0	11000
10.70	4	0	4	1440	4	0	11000
	MAXIMUM STORAGE=		11000(CF)				
* STREET RELEASE TO CITY STORM DRAIN SYSTEM DOWNSTREAM							
** STORAGE VOLUME IS A RESULT OF MAXIMUM POND ELEVATION							
				APPENDIX E			

		POND ANALYSIS AT SCOTTSDALE AND QUIMBY					
			STORM SYSTEM 4				
TIME (HRS)	INFLOW Q (CFS) *	SYSTEM CAPACITY (CFS)	EXCESS Q (CFS)	EXCESS VOLUME (CF)	OVERFLOW RELEASE (CFS)	AVAILABLE STORAGE (CF)	STORAGE VOLUME (CF)
8.10	26	26	0	0		34500	0
8.17	31.3	31.3	0	0		34500	0
8.20	33	31.3	1.7	92		34408	92
8.30	41	31.3	9.7	2052		32356	2144
8.40	48	31.3	16.7	4752		27604	6896
8.50	53	31.3	21.7	6912		20692	13808
8.60	55	31.3	23.7	8172		12520	21980
8.70	55	31.3	23.7	8532		3988	30512
8.75	53	31.3	21.7	3988	0	0	34500
8.80	52	31.3	20.7		20.7	0	34500
8.90	48	31.3	16.7		16.7	0	34500
9.00	44	31.3	12.7		12.7	0	34500
9.10	41	31.3	9.7		9.7	0	34500
9.20	38	31.3	6.7		6.7	0	34500
9.30	36	31.3	4.7		4.7	0	34500
9.40	34	31.3	2.7		2.7	0	34500
9.50	32	31.3	0.7		0.7	0	34500
9.53	31.3	31.3	0		0	0	34500
9.60	30	31.3	-1.3	-164		164	34336
9.70	28	31.3	-3.3	-828		992	33508
9.80	27	31.3	-4.3	-1368		2360	32140
9.90	26	31.3	-5.3	-1728		4088	30412
10.00	25	31.3	-6.3	-2088		6176	28324
10.10	24	31.3	-7.3	-2448		8624	25876
10.20	23	31.3	-8.3	-2808		11432	23068
10.30	22	31.3	-9.3	-3168		14600	19900
10.40	22	31.3	-9.3	-3348		17948	16552
10.50	21	31.3	-10.3	-3528		21476	13024
10.60	21	31.3	-10.3	-3708		25184	9316
10.70	21	31.3	-10.3	-3708		28892	5608
10.80	20	31.3	-11.3	-3888		32780	1720
10.84	20	31.3	-11.3	-1720		34500	0
10.90	19	19	0	0		34500	0
	MAXIMUM STORAGE=		34500 (CF)				

* ASSUMES STORM SYSTEMS 1 & 2 ARE NOT FUNCTIONING AND FLOW IS INCLUDED

APPENDIX F

INTERIOR DRAINAGE FORM 8

Settlement

1. Anticipated potential settlement has been determined and incorporated into the specified construction elevations to maintain the established freeboard margin.
   ☐ Yes ☐ No

2. The computed range of settlement is _____ ft. to _____ ft.

3. Settlement of the levee crest is determined to be primarily from:
   ☐ Foundation consolidation
   ☐ Embankment compression
   ☐ Other (describe) _____

4. Differential settlement of floodwalls
   ☐ has ☐ has not been accommodated in the structural design and construction.

Note: Attach engineering analysis to support construction plans.

Interior Drainage

1. Specify size of each interior watershed
   Draining to pressure conduit: 4 AC, 33.4 AC, 38 AC, 145 AC
   Draining to ponding area: NONE

2. Relationships Established
   Ponding elevation vs. storage: ☒ Yes ☐ No
   Ponding elevation vs. gravity flow: ☒ Yes ☐ No
   Differential head vs. gravity flow: ☒ Yes ☐ No

3. The river flow duration curve is enclosed: ☒ Yes ☐ No

4. Specify the discharge capacity of the pressure conduit: 22CFS, 115 CFS, 25.4 CFS, 31.3 CFS

5. Which Flooding Conditions Were Analyzed?
   - Gravity flow (Interior Watershed): ☒ Yes ☐ No
   - Common storm (River Watershed): ☒ Yes ☐ No
   - Historical ponding probability: ☒ Yes ☐ No
   - Coastal wave overtopping: ☐ Yes ☒ No

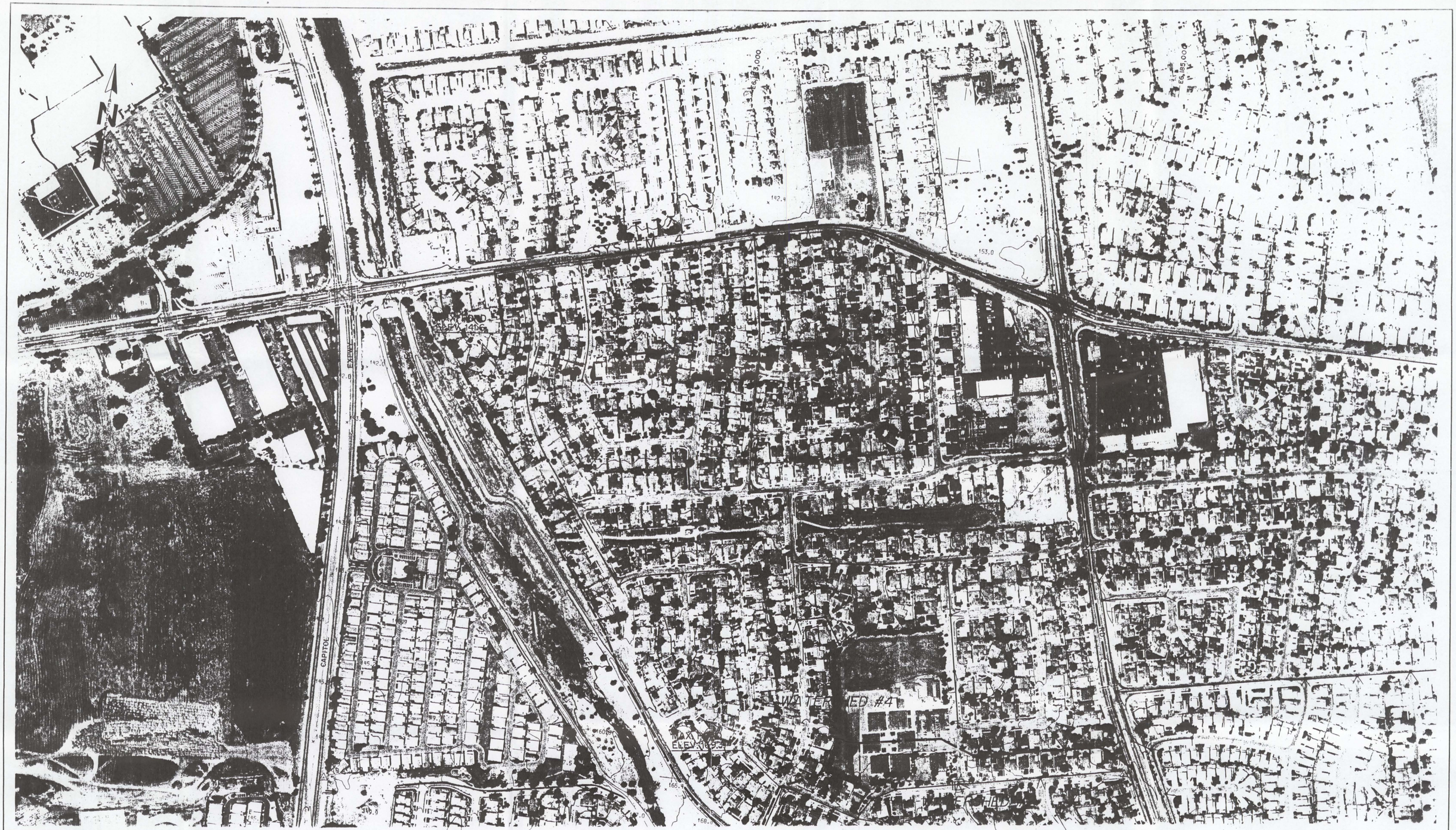
   If no, explain why: Coastal Wave Overtopping is not Applicable in this Situation.

6. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection
   ☒ Yes ☐ No

   If no, explain why: _____

7. The rate of seepage through the levee system for the 100-year flood is _____ cfs

APPENDIX F



REV	DESCRIPTION	DATE	APPR

REFERENCE INFORMATION AND NOTES

AELYTEK, INC.
JOB # 93901
PHOTO DATE: 5/14/93

Legend

WATERSHED BOUNDARY

TRUNK LINE & MANHOLE

DATE	
DESIGN	
DRAWN	
CHECKED	

Santa Clara Valley Water District

ENGINEERING CERTIFICATION

ENGINEERING APPROVAL

ATTACHMENT A

SCALE 1" = 200'

SHEET 1



REV.	DESCRIPTION	DATE	APPR.

REFERENCE INFORMATION AND NOTES

AELYTEK, INC.
JOB # 93901
PHOTO DATE: 5/14/93

Legend

WATERSHED BOUNDARY

TRUNK LINE & MANHOLE

DATE	
DESIGN	
DRAWN	
CHECKED	

Santa Clara Valley Water District

ENGINEERING CERTIFICATION

ENGINEERING APPROVAL

ATTACHMENT A

SCALE: 1"= 200'

SHEET: 2

Attachment E

"Geotechnical Investigation Report for Thompson Creek Levees"
Earth Tech
June, 1999

THIS BOUND REPORT IS INCLUDED SEPARATELY FROM THE APPLICATION BINDER

Attachment F

Maintenance Program Guidelines
Channel Maintenance Program Guidelines Extracted from
"Thompson Creek Planning Study (Quimby Road to Westgrove Lane)"
Santa Clara Valley Water District. August 1988

Levee Maintenance Guidelines also Included

THOMPSON CREEK
MAINTENANCE PLAN

A maintenance program will ensure the safe and efficient operation of the flood control measures. The objective of the program is to establish evaluation criteria for periodic maintenance activities. These maintenance activities include sediment, debris, vegetation and trash removal, weed control and elimination of other potentially hazardous conditions. Other activities that would be performed as required include: rodent control, erosion repair, fence repair and installation, replacement of regulatory signs and other general activities.

These plans will be carried out as permitted by environmental codes and regulations.

Channel and Floodplain Maintenance Plan

The recommended maintenance program guidelines are explained below by channel type and are summarized in Table 1. The reaches are defined according to different channel characteristics.

Quimby Road Drop Structure

This includes the culvert at Quimby Road, drop structure, stream gage weir and and concrete lined channel between the drop structure and the culvert. The drop structure and weir are critical features which control the depth upstream. All blockage from debris or vegetation in the culvert will be removed to allow the drop structure to operate properly. Sediment accumulation in this area will be removed when it reaches an average depth of one foot.

Excavated Earth Channel

From the drop structure upstream about 1,000 feet to the widened, modified floodplain area, the channel is excavated earth with rock side slope protection. Flexible vegetation, such as cattails and brush, will be removed when they occupy over 50% of any channel cross section area. Rigid vegetation (woody growth) will be removed from the channel bottom when they occupy over 10% of any channel cross section area. Vegetation within accumulated sediment will also be removed during the removal of sediment. Sediment accumulation will be removed when it reaches an average depth of two feet.

Modified Floodplain Channel with Low-Flow Channel and Setback Levees

The remainder of the channel upstream to Westgrove Lane is a modified floodplain with setback levees and a low-flow channel. The low-flow channel in this reach will require minor periodic maintenance. Obstructions or rigid vegetation occupying over 20% of the channel cross section area will be removed and when vines, bushes or weeds occupy more than 50% of the low-flow channel cross section area they will be removed or trimmed. Rigid vegetation on the floodplain will be removed when they occupy over 10% of the cross section area. Weeds and grasses will not be allowed to occupy over 50% of the cross section area. Sediment will be removed from the low-flow channel when it reaches an average depth of two feet at any location, and from the floodplain when it reaches an average depth of two feet at any location.

Table 1: Thompson Creek – Quimby Road to Westgrove Lane Maintenance Guidelines for Sediment and Vegetation Removal

Channel Type	Maintenance Issue	Acceptable Maintenance Limit	Corrective Action
DROP STRUCTURE AND CULVERT *Includes culvert, concrete-lined channel, and drop structure about 70' u/s of bridge face*	Sediment	Average Depth Greater Than 1'	Remove Sediment
	Debris and Blockage		Remove Blockage
EXCAVATED EARTH CHANNEL *Includes straight reach of channel for about 1,000 feet upstream of drop structure, until levees widen into the modified floodplain*	Sediment	Average Depth Greater Than 2'	Remove Sediment
	Area of Sediment with Vegetation	Sediment Depth of 2'	Remove Sediment and Vegetation
	Rigid Vegetation (Woody growth)	Occupying over 10% of the channel section	Remove vegetation from channel
	Flexible Vegetation (Cattails, etc)	Occupying 50% of the cross section	Remove vegetation from channel
MODIFIED FLOODPLAIN AREA *Includes the floodplain area between the low-flow channel and setback levees, from about 1,000 feet u/s Quimby Rd. to Westgrove Lane*	Sediment	Average Depth Greater Than 2'	Remove Sediment
	Area of Sediment with Vegetation	Sediment Depth of 2'	Remove Sediment and Vegetation
	Rigid Vegetation (Woody growth)	Occupying over 10% of the channel section	Remove vegetation
	Flexible Vegetation (Cattails, etc)	Occupying 50% of the cross section	Remove vegetation
LOW-FLOW CHANNEL WITHIN MODIFIED FLOODPLAIN *Includes the low-flow channel from about 1,000 feet u/s Quimby Rd. to Westgrove Lane*	Sediment	Average Depth Greater Than 2'	Remove Sediment
	Debris and Blockage		Remove Blockage
	Area of Sediment with Vegetation	Sediment Depth of 4'	Remove Sediment and Vegetation
	Rigid Vegetation (Woody growth)	Occupying over 20% of the channel section	Remove vegetation
	Flexible Vegetation (Cattails, Brush, etc)	Occupying 50% of the cross section	Remove or trim vegetation

THOMPSON CREEK
LEVEE MAINTENANCE PLAN

Inspection shall be made at intervals of not-to-exceed 90 days, before the flood season, after each major high water period, after each earthquake of greater than Richter 5.0, and in response to specific requests for maintenance service to ensure that the following conditions do not compromise the integrity of the levee system.

These plans will be carried out as permitted by environmental codes and regulations.

1. No unusual settlement, sloughing, or material loss of grade has taken place. In all cases where the levee grades settle below the design elevations, the crown grade must be raised to the original designed grade with appropriate materials. Service and levee roads are to be maintained in original condition.

2. No caving has occurred on either the landside or waterside of the levee, which might affect the stability of the levee section.

3. No seepage, saturated areas, or sand boils are occurring.

4. Channel conditions at outfall locations allow for safe passage of flood flows.

5. There is no unauthorized vehicular traffic on the levee.

6. Encroachments are not being made on the levee rights-of-way, which might endanger the structure or hinder its proper and efficient functioning during times of emergency.

7. The outboard levee slopes will be selectively sprayed with pre- and post-emergents. The grass is mowed to six inches or less on an annual basis.

8. Burrowing animals such as muskrats, ground hogs, ground squirrels, moles, and gophers found in the levee will be exterminated.. The District works with a private contractor for this function and will be notified of evidence of burrowing animals (In 2000, contractor is Animal Damage Management Inc.).

9. Service roads shall be maintained in such condition that they will be accessible at all times to all vehicles used in maintenance work or flood responses.

10. Potential bank erosion extending close to the toe of the levee along the low-flow channel shall be monitored. Levee and bank erosion conditions will be periodically inspected and evaluated, and slope protection measures will be implemented as necessary.

It shall be the responsibility of the Santa Clara Valley Water District's Operation and Maintenance Group for the performance of the maintenance activities in this Maintenance Plan for Thompson Creek between Quimby Road and Westgrove Lane. This plan shall be executed and become effective upon the date it is signed by the Santa Clara Valley Water District's Operation and Maintenance Group Manager for Flood Control.

Jeanette L. Micko

Jeanette L. Micko, P.E.
Acting Operation and Maintenance Group Manager
Santa Clara Valley Water District

3/30/00
Date

Attachment G

Excerpt from FIS for City of San Jose;
showing that Thompson Creek does not have a designated floodway.

FIS - CITY OF SAN JOSE
V 1062

Analysis for streams studied by approximate methods was based on historical information, an existing report (Reference 40), and field observations.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program (NFIP) encourages State and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:6,000 (Reference 41), supplemented with aerial photogrammetry at scales of 1:6,000 and 1:12,000 (References 35 and 36).

Shallow flooding and approximate boundaries were delineated using the aforementioned maps. Because the entire community is subject to 100-year flooding, no 500-year flood boundaries have been shown.

For stream channels designated as "Zone A contained in Channel," the 100-year flood boundaries are based on the existing channel alignment and right-of-way.

Approximate 100-year flood plain boundaries in some portions of the study area were taken directly from the Flood Hazard Boundary Map (Reference 43).

Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to limitations of the map scale, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself.

One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood plain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. However, many perched channels in San Jose have no overbank areas that allow a continuous water surface across the channel and the overbanks. Instead, overbank areas are lower than the channel bank elevations; therefore, once water overtops the channel banks, it flows along a separate path as sheet flow. Floodways are not applicable in sheet flow areas.

Forcing floodwaters from perched channels to stay within the channel banks during the 100-year flood by placing imaginary encroachments parallel to the channels is not reasonable as most of the areas along the channels are totally developed, and many structures are along or close to the channel. Filling in the gaps between structures is unreasonable, and upstream encroachments could lead to a worsening of some downstream overflows or could cause new overflows and subject new properties to overflow from the channels.

Due to the extensive sheet flow in the flood plains and the extent of urbanization in the community, no floodways were designated on the following channels studied in San Jose: South Babb Creek, Berryessa Creek, Calabazas Creek, Canoas Creek, Guadalupe River, Los Gatos Creek, Miguelita Creek, Upper Penitencia Creek, Ross Creek, Sierra Creek, Silver Creek, and Thompson Creek.

Floodways were designated for the following creeks:

Alamitos Creek: For the valley channel reach from approximately 2000 feet upstream of Guadalupe River confluence to Camden Avenue, floodways were based on equal-conveyance reduction. From the confluence with Guadalupe River to a point 2000 feet upstream the floodways approximated the 100-year flood plain boundaries and included the existing channel and percolation pond. The reach through the Santa Clara Valley Water District percolation ponds has depths in excess of 4 feet.

Arroyo Calero: The floodway for Arroyo Calero, a small valley channel, was computed on the basis of equal-conveyance reduction.

Coyote Creek: Floodway boundaries for Coyote Creek were based on equal-conveyance reduction unless the channel was perched. For perched channel reaches, floodways were designated where the flow rate could be increased to obtain up to a 1-foot rise in water surface without causing flooding which did not exist in the 100-year flood. The one exception to these methods for designating floodways occurred through a reach of quarry approximately 3 miles downstream of Anderson Dam. Floodways for the quarry reach were based on the limit of effective flow for the east floodway boundary and the top of the levee (the 100-year flood plain boundary) for the west floodway boundary. Floodways could not be designated from Sinclair Freeway (Interstate Highway 280) downstream to the Silver Creek confluence nor from 2500 feet upstream of Trimble Road to San Francisco Bay, due to the perched channel condition. For the reach of Coyote Creek upstream of cross section CK the floodway was delineated to preserve the volume-discharge relationship as much as possible with the minimum effect on the overall floodway. This was necessary to include the effect of the percolation ponds in this area. In cases in which a percolation pond could not be excluded from the floodway in its entirety, the floodway was delineated to include all of the pond. The ponds are either completely within the floodway or completely out.

Fisher Creek and Fisher Creek Overbank: Floodways for Fisher Creek were based on equal-conveyance reduction for valley channel reaches. For perched channel reaches, the floodways were designated where the flow rate could be increased up to a rise in water surface of 1 foot without causing flooding which did not exist in the 100-year flood. At a point approximately 500 feet upstream of Richmond Avenue to the upstream limit of study at Tilton Avenue, floodways were based on equal-conveyance reduction. In two separate reaches downstream of Richmond Avenue it was necessary to maintain storage volumes so as to minimize changes in downstream flooding. The first reach included the separately modeled Fisher Creek Overbank floodway, which contained the east and west overflows from the spill 500 feet upstream of Richmond Avenue. This reach terminated at Bailey Avenue. The second reach, requiring storage, extended from approximately 1500 feet downstream of Bailey Avenue to a point

about 3000 feet upstream of the Coyote Creek confluence. For both of these reaches, the designated floodways approximated the 100-year flood plain boundaries. Floodway data is not presented for cross sections A through I on Fisher Creek because the floodway was based on storage considerations rather than conveyance.

The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 3).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and 100-year flood plain boundaries are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and 100-year flood plain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 12.

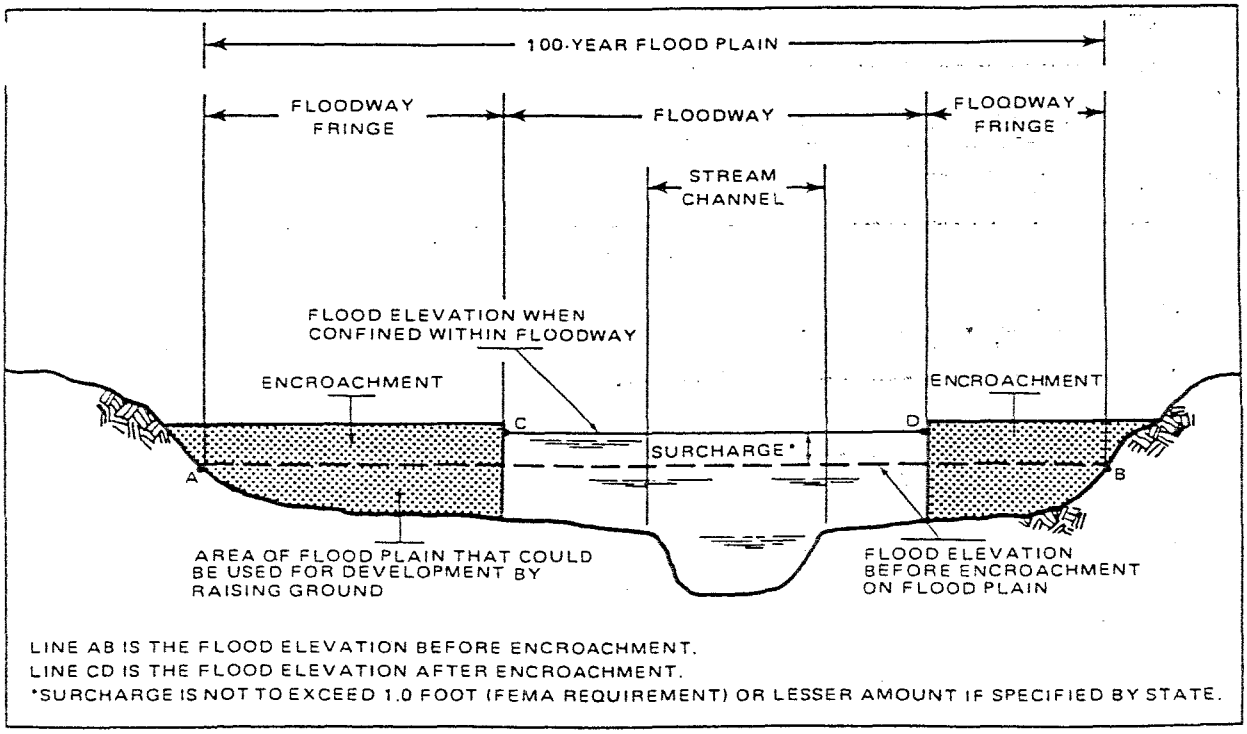


Figure 12. Floodway Schematic

Attachment H

Table: Thompson Creek, Quimby Road to Westgrove Lane
Stormdrains that Penetrate the Levee System

Attachment H: Thompson Creek
Quimby Road to Westgrove Lane
Stormdrains that Penetrate the Levee System

Stormdrain Location	Bank [b]	Station	Outfall Invert Elevation (ft)	Outfall Diameter (in)	Drawing	Drawing Sheet Nos.
Scottsdale Ct.	left	34+05	156.0	12	1980 SCVWD Plans [c]	4 & 15B
Pettigrew Ct.	right	38+00	158.7	24	1994 CSJ Plans [d]	1-4
Everdale Dr. [a]	right	44+35	166.7	24	1994 CSJ Plans	1-3 & 5
Everdale Dr.	left	44+10	161.7	21	1994 CSJ Plans	1-3 & 5
Westgrove Ln.	left	56+70	175.6	12	1994 CSJ Plans	1-3 & 6

a\ 18" outfall at the right bank at Everdale was plugged in 1994 and replaced with a 24" outfall, located just downstream of the old outfall.
b\ left and right bank designations are looking upstream
c\ Map and Construction Plan for Thompson, Lower Silver, and Quimby Creeks; Santa Clara Valley Water District; 1980 (as-built).
d\ Plans for Thompson Creek Outfall Improvements; City of San Jose; 1994 (as-built).

This updated table was sent to Michael Baker Inc. 6/9/00

Updated table sent to Michael Baker Inc. 6/9/00

Thompson Creek
Quimby Road to Westgrove Lane
Stormdrains which Penetrate the Levee System

Stormdrain Location	Bank [c]	Station	Outfall Invert Elevation (ft)	Outfall Diameter (in)	Drawing	Drawing Sheet Nos.
Scottsdale Ct.	left	34+05	156.0	12	1980 SCVWD Plans [d]	4 & 15B
Pettigrew Ct.	right	38+00	158.7	24	1994 CSJ Plans [e]	1-4
Pettigrew Ct.	right	38+10	161	18	1994 CSJ Plans	1-4
Everdale Dr. [a]	right	43+90	166.7	24	1994 CSJ Plans	1-3 & 5
Everdale Dr. [b]	left	44+10	161.7	21	1994 CSJ Plans	1-3 & 5
	left	44+25	166.5	24	"	"
Westgrove Ln.	left	57+30	175.6	12	1994 CSJ Plans	1-3 & 6

a\ 18" outfall at the right bank at Everdale was plugged in 1994 and replaced with a 24" outfall, located just downstream of the old outfall.
b\ a single 21" stromdrain through the levee drains to two outfalls
c\ left and right bank designations are looking upstream
d\ Map and Construction Plan for Thompson, Lower Silver, and Quimby Creeks; Santa Clara Valley Water District; 1980 (as-built).
e\ Plans for Thompson Creek Outfall Improvements; City of San Jose; 1994 (as-built).

Attachment I

Table: Thompson Creek and Lower Silver Creek Stationing

Thompson Creek & Lower Silver Creek Stationing

Creek	Location	FIS Profile	HEC-2 Post-Project Models	1980 Plans [a]				1991 Plans [b]	
				TCR line	TCL line	TC line	LS line	TCL line	TCR line
Lower Silver	Cunningham Ave.	24,480							
Lower Silver	Tully Rd.						36+50		
Lower Silver	Norwood Creek						11+45		
	confluence L. Silver w/ Thompson	31,450				325+00	10+00		
Thompson	d/s face Quimby Rd. culvert		9+61			317+13			
Thompson	u/s face Quimby Rd. culvert		10+61			316+03			
Thompson	drop u/s Quimby Rd.		11+06			315+64		10+15	10+40
Thompson	Channel transition		21+89	305+60		305+00		20+75	21+30
Thompson	Pettigrew Ct.			288+72	288+25			37+15	38+45
Thompson	Everdale Dr.		41+47	284+33	282+95			41+18	43+41
Thompson	Bagworth Ct.			278+88				46+50	49+46
Thompson	Westgrove Ln.			272+30				53+05	
Thompson	Quimby Creek		60+85	270+45					
Thompson	d/s face Aborn Rd. culvert		71+04	260+79					

a\ Four different control lines were used on the 1980 construction plans. The "TC" lines are for Thompson Creek; the LS line is for Lower Silver Creek. TCR and TCL stand for right and left bank, looking downstream. Stationing increases from upstream to downstream.

b\ Two control lines were used on the 1991 construction plans. TCR and TCL lines are for the right and left bank, looking upstream. Stationing increases from downstream to upstream.

Attachment J

FIRM Maps Showing Revised Floodplain

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
SAN JOSE,
CALIFORNIA
SANTA CLARA COUNTY

PANEL 33 OF 64
(SEE MAP INDEX FOR PANELS NOT PRINTED)

Adjacent Panel

COMMUNITY-PANEL NUMBER
060349 0033 E

MAP REVISED:
AUGUST 17, 1998

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
SAN JOSE, CALIFORNIA
SANTA CLARA COUNTY

PANEL 27 OF 64
(SEE MAP INDEX FOR PANELS NOT PRINTED)

Actual Revision Location

COMMUNITY-PANEL NUMBER
060349 0027 D

EFFECTIVE DATE:
AUGUST 2, 1982

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
SAN JOSE, CALIFORNIA
SANTA CLARA COUNTY

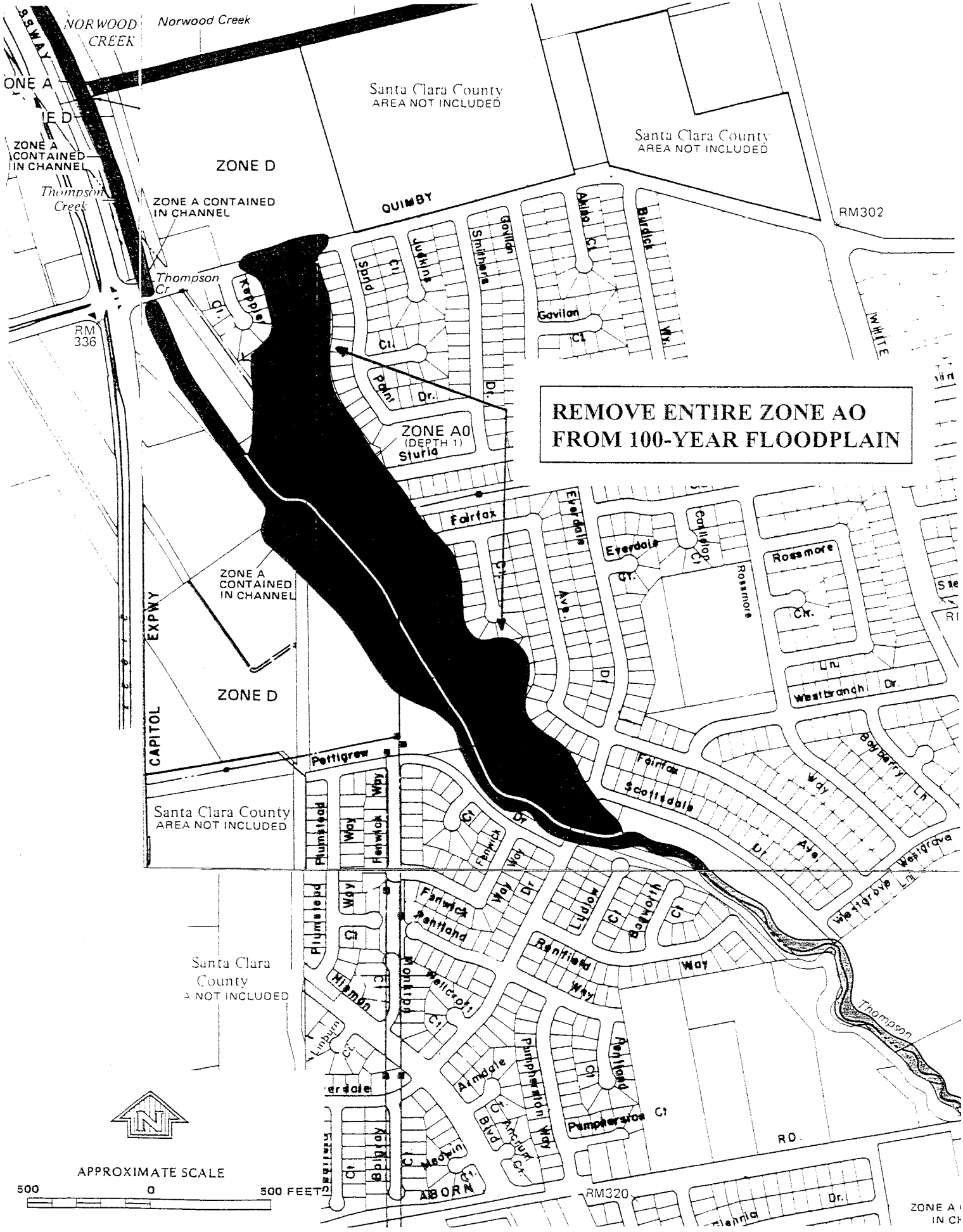
PANEL 26 OF 64
(SEE MAP INDEX FOR PANELS NOT PRINTED)

Adjacent Panel

COMMUNITY-PANEL NUMBER
060349 0026 D

EFFECTIVE DATE:
AUGUST 2, 1982

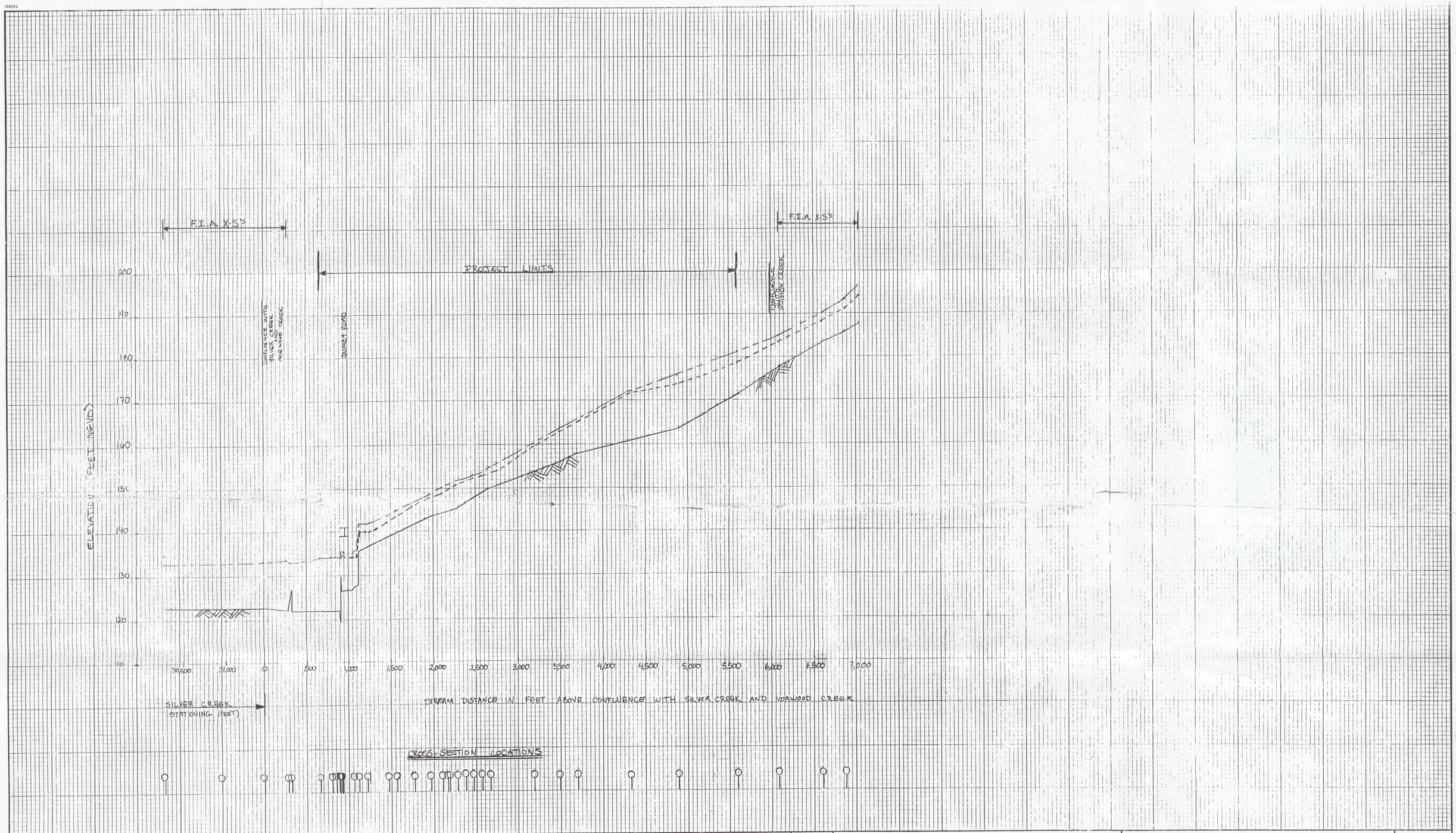
Federal Emergency Management Agency


REMOVE ENTIRE ZONE AO
FROM 100-YEAR FLOODPLAIN
NORWOOD CREEK
Norwood Creek
Santa Clara County
AREA NOT INCLUDED
Santa Clara County
AREA NOT INCLUDED
ZONE D
ZONE A CONTAINED IN CHANNEL
Thompson Creek
ZONE A CONTAINED IN CHANNEL
QUIMBY
RM302
Thompson Cr.
RM 336
ZONE A0
(DEPTH 1)
Fairfax
ZONE A CONTAINED IN CHANNEL
EXPWY
CAPITOL
ZONE D
Pettigrew
Santa Clara County
AREA NOT INCLUDED
Santa Clara County
A NOT INCLUDED
Thompson
RM320
APPROXIMATE SCALE
500
0
500 FEET

Attachment K

Post-Project Profile, Thompson Creek

~~THIS IS AN OVERSIZED PLOT AND IS INCLUDED SEPARATELY FROM THE APPLICATION BINDER~~



REV	DESCRIPTION	DATE	APPR

REFERENCE INFORMATION AND NOTES

SCALE

H: 1" = 500'

V: 1" = 10'

LEGEND

100-YEAR FLOOD

10-YEAR FLOOD

STREAMBED

CROSS SECTION LOCATION

DATE	
DESIGN	
DRAWN SD	
CHECKED	

Santa Clara Valley Water District

THOMPSON CREEK

San Jose, CA

Post-Project Profile 1% and 10% flows for FEMA LOMR

SCALE

SHEET 1 of 1

Attachment L

Letter from Mayor of City of San Jose

CITY OF SAN JOSÉ, CALIFORNIA

801 NORTH FIRST STREET
SAN JOSE, CA 95110-1792
(408) 277-4237
FAX (408) 277-3868

SUSAN HAMMER
MAYOR

10/20 RRT SNU EHS

October 23, 1991

1871 '91 OCT 29 A2:04

Mr. John Matticks
Risk Studies Division
Federal Insurance Administration
Federal Emergency Management Agency
500 "C" Street, SW
Washington, D.C. 20472

Dear Mr. Matticks:

This is a request for changes to the effective flood insurance rate maps for Lower Silver Creek and Thompson Creek within the City of San Jose, as described in the submittal from the Santa Clara Valley Water District.

Sincerely,

Susan Hammer
Mayor

SH:ds

cc: Mr. Randall R. Talley
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Attachment M

Diskette containing
Duplicate Effective Model (THOMPRE.DAT);
Post-Project Conditions Model (THOMPOST.DAT);
and
Post-Project Model with Sediment, showing adequate capacity
(THOMSED.DAT)

Attachment N

Printouts of runs for

THOMPRE.DAT;
THOMPOST.DAT;
and
THOMSED.DAT

```
1*****************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    09MAR00    TIME   08:52:54  *
*****************************************
```

```
**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*          (916) 756-1104            *
**************************************
```

THOMPRE.DAT Duplicate Effective Model

```
X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```


THIS RUN EXECUTED 09MAR00 08:52:54

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**************************************
```

```
T1      GEORGE S. NOLTE AND ASSOCIATES --DUPLICATE EFFECTIVE MODEL FOR LOMR
T2      THOMPSON CREEK--EXTRACTED FROM SILVER CREEK FIS
T3      EDITED BY DUCKLER 1/00 AND RENATI 11/99  SWSEL FROM SILVER RUN

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0         2                                                          132.8

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                   -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

       150

J5  LPRNT     NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10       -10

NC     .030       .030       .035        .3         .5
QT       2       2000       2080
X1   30262          8        950       1060        125        125        125
GR   132.0        950        130        962      125.0        972      122.7        978      122.7       1035
GR     125       1042        130       1050      131.6       1060

QT       2       3300       2080
NC                         0.030       0.10       0.20
X1   30947          7        959       1038        685        685        685
GR   132.7        900        132        959      122.8        978      122.8       1023        131       1038
GR     132       1090        134       1100

QT       2       3600       2080
X1   31447          8        955       1042        500        500        500
GR   134.3        850      133.8        955      122.9        972      122.9       1023        124       1033
GR     132       1042        134       1095        136       1110
```

```
QT        2       1900       1480
          CONFLUENCE WITH NORWOOD CK
          START THOMPSON CK STATIONING
X1      271          7        958       1048         350         350         350
GR    135.       900.     134.       958.       122.       980.       122.       1035.       134.       1048.
GR    136.       1115.    138.       1133.
          1
   09MAR00       08:52:54                                                                                  PAGE    2


X1      321          7        960       1041          50          50          50
GR    135.       900.     134.       960.       126.7      978.       126.7      1021.       134.       1041.
GR    136.       1110.    138.       1130.

X1      895          9        960       1044         574         574         574
GR    137.       840.     136.       960.       134.       967.       127.       975.        127.       1023.
GR    128.       1025.    136.       1044.      138.       1080.      140.       1111.

X1      945          4        978       1022          50          50          50
X3       10         10
GR    139.0      978.     127.1      978.1      127.1      1021.9     139.0      1022.

NC      .030       .030       .015         .3          .5
          QUIMBY ROAD     TRIPLE BOX
X1      960          4      971.2     1018.3          15          15          15
X3       10
GR    142.2      971.2    127.1      971.3      127.1      1018.2     142.2      1018.3

SB     0.90       1.25       3.1          1       37.5         1.5         432           0       127.3       127.1
X1     1058                                        98          98          98           1         .20
X2                               1      139.1      142.2
X3       10

X1     1078          8      970.5     1029.5          20          20          20
X3       10
GR    143.0      970.5    140.0      970.6      134.5      979.       127.8      979.1       127.8      1020.9
GR    134.5      1021.    140.0      1029.4     143.0      1029.5

NC      .033       .033       .050         .2          .3
          SACKED  CONCRETE DROP STRUCTURE
X1     1100          7        961       1038          17          17          17
GR    142.       900.       141.8      961.       133.5      985.       132.6      1000.       133.       1016.
GR    141.3      1038.      142.       1080.

X1     1165          8        954       1046          65          65          65
GR    143.       926.       143.       954.       137.       975.       137.       1000.       134.       1016.
GR    136.       1025.      142.6      1046.      142.6      1066.

X1     1260          8        949       1053          95          95          95
GR    144.       932.       144.5      949.       138.       971.       137.5      1011.       136.       1019.
GR    139.5      1039.      142.4      1053.      142.5      1072.

X1     1360          7        945       1058         100         100         100
GR    145.6      930.       146.       945.       142.5      956.       139.5      982.        137.5      1013.
GR    138.5      1037.      144.5      1058.

X1     1460         10        945       1078         100         100         100
GR    146.7      930.       146.7      945.       142.5      960.       142.5      970.        139.5      985.
GR    138.3      1000.      139.7      1012.      139.6      1038.      145.7      1078.       146.3      1102.
          1
   09MAR00       08:52:54                                                                                  PAGE    3


X1     1562         10        938       1070          98          98          98
GR    147.5      922.       147.5      938.       143.5      960.       139.3      983.        139.3      1000.
GR    140.2      1008.      140.7      1027.      143.5      1058.      146.8      1070.       147.       1093.

X1     1660          9        932       1063         102         102         102
GR    148.       917.       148.       932.       145.5      944.       140.6      985.        140.2      996.
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GR   141.3    1000.      141.7      1030.      147.       1063.      147.7      1089.

X1     1760         10        931        1062         100         100         100
GR   149.5    920.       149.4      931.       146.2      943.       142.5      974.       142.5      987.
GR   140.     1000.      141.3      1008.      145.5      1051.      148.       1062.      148.5      1088.

X1     1960         10        938        1063         200         200         200
GR   150.7    920.       150.8      938.       147.4      950.       147.       962.       143.       982.
GR   144.2    1000.      144.       1024.      147.       1052.      150.       1063.      150.       1087.

          TRANSITION TO MODIFIED FLOOD PLAIN
X1     2100         10        931        1069          40          40          40
GR   152.5    917.       152.5      931.       147.7      946.       147.2      963.       144.5      992.
GR   142.3    999.       147.       1000.      148.       1034.      151.       1069.      151.       1092.

X1     2275         13        983        1019         175         175         175
GR   153.6    850.       153.6      863.       149.1      876.       148.5      912.       150.4      983.
GR   147.     993.       144.5      998.       140.5      1002.      151.       1019.      149.3      1060.
GR   149.     1141.      153.       1151.      153.5      1175.

X1     2435          8        990        1010         160         160         160
GR   155.     850.       151.       860.       150.       990.       147.       1000.      150.       1010.
GR   152.     1023.      149.       1140.      155.       1150.

X1     2560                                              125         125         125                    1.2

X1     2685                                              125         125         125                    1.2

X1     2885         10        992        1010         200         200         200
GR   159.5    850.       155.5      860.       154.       992.       152.       995.       151.8      1000.
GR   152.     1005.      154.       1010.      156.       1025.      154.6      1140.      159.5      1150.

X1     3035                                              250         250         250                    2.5

X1     3335         11        985        1016         300         300         300
GR   164.     850.       159.       860.       162.1      985.       160.       993.       156.       997.
GR   155.9    1000.      156.       1002.      160.       1007.      161.       1016.      159.       1140.
GR   164.     1150.

X1     3535                                              200         200         200                    1.6

          END OF EAST LEVEE
X1     3710         11        990        1011         175         175         175
GR   167.5    830.       165.5      860.       165.       950.       164.       988.       162.       990.
GR   160.     996.       158.4      1000.      160.       1006.      164.       1011.      165.       1033.
GR   167.     1085.
        1
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QT         2        2000       1480
X1     3815         10        988        1011         105         105         105
GR   167.5    800.       167.5      850.       166.       960.       164.       988.       160.       996.
GR   159.4    1000.      160.       1006.      164.       1011.      166.       1033.      168.       1044.

QT         2        2200       1480
X1     3975          8        988        1013         160         160         160
GR   168.5    810.       168.       930.       166.       988.       162.       998.       160.8      1000.
GR   162.     1005.      168.       1013.      170.       1040.

QT         2        2400       1480
X1     4105          8        987        1019         130         130         130
GR   169.5    890.       168.       987.       162.       995.       161.8      1000.      162.       1005.
GR   168.     1019.      170.       1075.      172.       1116.

QT         2        2600       1480
X1     4315         10        987        1011         210         210         210
GR   172.     820.       171.       950.       170.       987.       168.       994.       164.       998.
GR   163.5    1000.      164.       1002.      170.       1011.      172.       1020.      173.       1035.

QT         2        2800       1480
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X1     4530          9        986       1019         215         215         215
GR   174.5     820.       174.       920.       172.       986.       166.       998.       165.5      1000.
GR   166.      1002.      170.       1008.      174.       1019.      176.       1031.

X1     4700         13        988       1028         170         170         170
GR   176.      900.       175.       950.       174.       978.       172.       988.       170.       990.
GR   168.      997.       167.2      1000.      168.       1008.      172.       1024.      174.       1028.
GR   176.      1062.      176.       1125.      178.       1143.

QT        2       3000       1440
X1     4840          8        963       1012         140         140         140
GR    177.       900.      176.       963.       170.       991.       168.2      1000.      170.       1009.
GR    176.       1012.     178.       1080.      180.       1090.

X1     5065          8        980       1020         225         225         225
GR   179.3     900.       178.       980.       172.       995.       170.8      1000.      172.       1007.
GR    178.       1020.     180.       1110.      182.       1115.

X1     5360         11        985       1036         295         295         295
GR   184.5     900.       184.       909.       182.       945.       180.       985.       176.       995.
GR   174.1     1000.      176.       1013.      180.       1036.      182.       1065.      184.       1102.
GR   186.      1110.

X1     5710          8        970       1028         350         350         350
GR   187.      900.       186.       950.       184.       970.       176.       999.       175.8      1000.
GR   176.      1002.      186.       1028.      187.5      1100.
        1
   09MAR00       08:52:54                                                                                  PAGE    5


QT        2       2700       1440
X1     6060          7        958       1020         350         350         350
GR   189.2     900.       188.       958.       180.       992.       178.4      1000.      180.       1005.
GR   188.      1020.      190.       1065.

X1     6430          9        980       1018         370         370         370
GR   192.5     930.       192.       965.       190.       980.       182.       995.       181.6      1000.
GR   182.      1005.      190.       1018.      192.       1058.      192.5      1090.

X1     6665          9        965       1029         235         235         235
GR   194.8     940.       194.       965.       190.       981.       184.       992.       183.2      1000.
GR   184.      1005.      192.       1020.      194.       1029.      194.8      1091.

X1     6885          9        958       1035         220         220         220
GR   196.3     920.       196.       958.       192.       980.       186.       992.       185.5      1000.
GR   186.      1008.      192.       1022.      196.       1035.      198.       1085.

X1     7041          9        978       1020         156         156         156
GR   200.      962.       198.       978.       188.       995.       187.7      1000.      188.       1002.
GR   190.      1008.      196.       1020.      198.       1025.      199.       1040.
        1
   09MAR00       08:52:54                                                                                  PAGE    6


T1      GEORGE S. NOLTE AND ASSOCIATES
T2      THOMPSON CREEK--EXTRACTED FROM SILVER CREEK FIS  10% FLOW
T3      WATER SURFACE FROM BAKER/FEMA RUN

J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

                3                                                                          133.96

J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

     2                    -1


        1
   09MAR00       08:52:54                                                                                  PAGE    7
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THIS RUN EXECUTED 09MAR00 08:52:54

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

EDITED BY DUCKLER 1/00 A

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	30262.000	.00	.00	.00	122.70	2000.00	132.80	.00	132.89	2.34	2.41	829.05	1308.35
	30262.000	.00	.00	.00	122.70	2080.00	133.96	.00	134.03	1.61	2.17	956.65	1639.07
	30947.000	685.00	.00	.00	122.80	3300.00	132.87	.00	133.22	6.35	4.90	749.76	1309.42
	30947.000	685.00	.00	.00	122.80	2080.00	134.05	.00	134.14	1.37	2.49	985.34	1775.16
	31447.000	500.00	.00	.00	122.90	3600.00	133.17	.00	133.52	5.69	4.78	767.94	1509.05
	31447.000	500.00	.00	.00	122.90	2080.00	134.11	.00	134.21	1.33	2.45	902.21	1805.89
	271.000	350.00	.00	.00	122.00	1900.00	133.57	.00	133.65	1.20	2.28	831.73	1735.27
	271.000	350.00	.00	.00	122.00	1480.00	134.20	.00	134.24	.60	1.67	889.84	1915.36
*	321.000	50.00	.00	.00	126.70	1900.00	133.37	.00	133.72	10.53	4.72	402.94	585.40
*	321.000	50.00	.00	.00	126.70	1480.00	134.11	.00	134.27	4.29	3.20	462.39	714.19
	895.000	574.00	.00	.00	127.00	1900.00	133.95	.00	134.27	8.83	4.57	416.00	639.40
	895.000	574.00	.00	.00	127.00	1480.00	134.35	.00	134.53	4.44	3.32	445.73	702.56
*	945.000	50.00	.00	.00	127.10	1900.00	133.74	.00	134.40	19.71	6.52	291.44	428.02
*	945.000	50.00	.00	.00	127.10	1480.00	134.25	.00	134.59	9.60	4.72	313.43	477.60
*	960.000	15.00	.00	.00	127.10	1900.00	133.90	.00	134.45	3.93	5.95	319.16	958.25
*	960.000	15.00	.00	.00	127.10	1480.00	134.32	.00	134.61	1.99	4.37	338.80	1048.87
	1058.000	98.00	142.20	139.10	127.30	1900.00	133.94	.00	134.52	4.22	6.09	311.81	924.93
	1058.000	98.00	142.20	139.10	127.30	1480.00	134.33	.00	134.64	2.15	4.48	330.11	1008.49
	1078.000	20.00	.00	.00	127.80	1900.00	133.80	.00	134.69	7.46	7.56	251.25	695.48
	1078.000	20.00	.00	.00	127.80	1480.00	134.26	.00	134.73	3.61	5.47	270.70	778.60
*	1100.000	17.00	.00	.00	132.60	1900.00	137.29	137.29	139.01	255.66	10.52	180.53	118.83
*	1100.000	17.00	.00	.00	132.60	1480.00	136.69	136.69	138.21	265.48	9.89	149.62	90.83

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	1165.000	65.00	.00	.00	134.00	1900.00	139.48	139.48	140.94	274.54	9.68	196.20	114.67
*	1165.000	65.00	.00	.00	134.00	1480.00	139.00	139.00	140.28	287.80	9.06	163.32	87.24
*	1260.000	95.00	.00	.00	136.00	1900.00	141.82	.00	142.36	75.60	5.90	321.99	218.51
*	1260.000	95.00	.00	.00	136.00	1480.00	141.24	.00	141.71	77.08	5.49	269.64	168.57
	1360.000	100.00	.00	.00	137.50	1900.00	142.61	.00	143.20	90.42	6.14	309.37	199.82
	1360.000	100.00	.00	.00	137.50	1480.00	142.05	.00	142.56	91.68	5.73	258.24	154.57
	1460.000	100.00	.00	.00	138.30	1900.00	143.57	.00	144.09	85.19	5.75	330.31	205.86
	1460.000	100.00	.00	.00	138.30	1480.00	143.03	.00	143.48	91.04	5.42	272.83	155.11

	1562.000	98.00	.00	.00	139.30	1900.00	144.39	.00	144.87	73.96	5.55	342.25	220.92
	1562.000	98.00	.00	.00	139.30	1480.00	143.89	.00	144.29	73.48	5.10	289.92	172.66
	1660.000	102.00	.00	.00	140.20	1900.00	145.20	.00	145.79	103.11	6.15	308.79	187.11
	1660.000	102.00	.00	.00	140.20	1480.00	144.70	.00	145.21	104.21	5.75	257.35	144.98
	1760.000	100.00	.00	.00	140.00	1900.00	146.23	.00	146.72	80.94	5.59	339.63	211.20
	1760.000	100.00	.00	.00	140.00	1480.00	145.73	.00	146.15	81.49	5.19	285.02	163.95
	1960.000	200.00	.00	.00	143.00	1900.00	147.98	.00	148.55	101.67	6.07	312.88	188.43
	1960.000	200.00	.00	.00	143.00	1480.00	147.52	.00	148.01	104.30	5.61	263.83	144.92
*	2100.000	40.00	.00	.00	142.30	1900.00	149.07	149.07	150.15	296.35	8.35	227.65	110.37
*	2100.000	40.00	.00	.00	142.30	1480.00	148.66	148.66	149.64	323.21	7.93	186.63	82.32
*	2275.000	175.00	.00	.00	140.50	1900.00	151.10	.00	151.27	21.63	3.61	584.68	408.53
*	2275.000	175.00	.00	.00	140.50	1480.00	150.70	.00	150.86	24.57	3.66	473.72	298.56
*	2435.000	160.00	.00	.00	147.00	1900.00	151.55	.00	152.06	122.53	6.71	335.73	171.64
*	2435.000	160.00	.00	.00	147.00	1480.00	151.29	151.29	151.79	137.61	6.72	271.49	126.17
	2560.000	125.00	.00	.00	148.20	1900.00	152.93	.00	153.31	80.21	5.66	387.69	212.14
	2560.000	125.00	.00	.00	148.20	1480.00	152.75	.00	153.06	74.05	5.22	336.19	171.98
	2685.000	125.00	.00	.00	149.40	1900.00	154.02	.00	154.47	104.50	6.29	354.43	185.86
	2685.000	125.00	.00	.00	149.40	1480.00	153.79	.00	154.20	110.04	6.13	293.44	141.08
	2885.000	200.00	.00	.00	151.80	1900.00	156.09	.00	156.59	105.64	7.04	351.87	184.86
	2885.000	200.00	.00	.00	151.80	1480.00	155.90	.00	156.34	103.20	6.72	298.28	145.68
	3035.000	250.00	.00	.00	154.30	1900.00	158.63	.00	159.09	94.34	6.71	365.15	195.62
	3035.000	250.00	.00	.00	154.30	1480.00	158.42	.00	158.84	96.10	6.52	306.05	150.97
	3335.000	300.00	.00	.00	155.90	1900.00	161.43	.00	161.82	87.08	4.72	378.62	203.60
	3335.000	300.00	.00	.00	155.90	1480.00	161.22	.00	161.54	83.66	4.45	325.48	161.81
	3535.000	200.00	.00	.00	157.50	1900.00	163.09	.00	163.46	76.14	4.47	395.77	217.75
	3535.000	200.00	.00	.00	157.50	1480.00	162.85	.00	163.16	77.83	4.31	333.31	167.77

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	3710.000	175.00	.00	.00	158.40	1900.00	166.11	166.11	166.80	83.70	8.13	318.42	207.67
*	3710.000	175.00	.00	.00	158.40	1480.00	165.80	165.80	166.49	85.37	7.92	255.58	160.18
*	3815.000	105.00	.00	.00	159.40	2000.00	167.00	167.00	167.93	91.11	8.77	277.83	209.53
	3815.000	105.00	.00	.00	159.40	1480.00	166.61	.00	167.38	79.56	7.83	224.17	165.92
*	3975.000	160.00	.00	.00	160.80	2200.00	168.94	168.94	169.71	98.05	8.30	335.83	222.17
*	3975.000	160.00	.00	.00	160.80	1480.00	168.46	168.46	169.19	97.65	7.78	233.91	149.77
	4105.000	130.00	.00	.00	161.80	2400.00	170.06	.00	170.82	76.09	8.06	380.44	275.13
	4105.000	130.00	.00	.00	161.80	1480.00	169.64	.00	170.13	80.33	6.24	303.37	208.62
*	4315.000	210.00	.00	.00	163.50	2600.00	172.60	172.60	173.45	105.68	8.85	374.77	252.92
*	4315.000	210.00	.00	.00	163.50	1480.00	172.02	172.02	172.68	89.00	7.57	257.40	156.88
*	4530.000	215.00	.00	.00	165.50	2800.00	174.97	174.97	175.88	100.84	8.75	388.54	278.83
	4530.000	215.00	.00	.00	165.50	1480.00	173.98	.00	174.81	105.55	7.86	215.16	144.06
*	4700.000	170.00	.00	.00	167.20	2800.00	176.43	.00	177.04	45.24	7.00	489.48	416.31
*	4700.000	170.00	.00	.00	167.20	1480.00	175.42	.00	175.82	32.91	5.37	307.21	257.98
*	4840.000	140.00	.00	.00	168.20	3000.00	177.32	177.32	178.60	112.13	9.50	362.98	283.31
*	4840.000	140.00	.00	.00	168.20	1440.00	175.89	.00	176.60	82.52	6.80	211.89	158.52
*	5065.000	225.00	.00	.00	170.80	3000.00	179.94	179.94	180.90	88.74	8.87	428.28	318.46
	5065.000	225.00	.00	.00	170.80	1440.00	177.98	.00	179.20	149.73	8.87	162.32	117.68

	5360.000	295.00	.00	.00	174.10	3000.00	182.51	.00	183.51	87.19	8.53	392.34	321.28
*	5360.000	295.00	.00	.00	174.10	1440.00	181.39	.00	181.92	57.14	5.95	260.68	190.50
	5710.000	350.00	.00	.00	175.80	3000.00	185.67	.00	187.00	108.26	9.34	328.97	288.33
	5710.000	350.00	.00	.00	175.80	1440.00	183.70	.00	184.45	88.67	6.92	207.96	152.92
	6060.000	350.00	.00	.00	178.40	2700.00	189.03	.00	189.77	54.23	7.01	411.47	366.64
	6060.000	350.00	.00	.00	178.40	1440.00	186.58	.00	187.20	69.03	6.30	228.63	173.31
*	6430.000	370.00	.00	.00	181.60	2700.00	191.27	190.53	193.03	129.14	10.81	264.17	237.59
	6430.000	370.00	.00	.00	181.60	1440.00	189.45	.00	190.52	110.24	8.29	173.63	137.15
*	6665.000	235.00	.00	.00	183.20	2700.00	194.45	.00	195.25	61.75	7.22	382.65	343.60
	6665.000	235.00	.00	.00	183.20	1440.00	191.87	.00	192.50	61.46	6.37	226.16	183.68
	6885.000	220.00	.00	.00	185.50	2700.00	195.89	.00	196.57	56.12	6.61	408.20	360.41
	6885.000	220.00	.00	.00	185.50	1440.00	193.28	.00	193.84	59.54	6.02	239.18	186.62
*	7041.000	156.00	.00	.00	187.70	2700.00	196.46	196.46	199.09	238.04	13.00	207.85	175.00
*	7041.000	156.00	.00	.00	187.70	1440.00	194.21	194.21	196.23	265.74	11.40	126.36	88.33

EDITED BY DUCKLER 1/00 A

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	30262.000	2000.00	132.80	.00	.00	.00	110.00	.00
	30262.000	2080.00	133.96	1.16	.00	.00	110.00	.00
	30947.000	3300.00	132.87	.00	.07	.00	194.33	685.00
	30947.000	2080.00	134.05	1.18	.09	.00	200.00	685.00
	31447.000	3600.00	133.17	.00	.30	.00	117.03	500.00
	31447.000	2080.00	134.11	.94	.06	.00	208.05	500.00
	271.000	1900.00	133.57	.00	.40	.00	88.75	350.00
	271.000	1480.00	134.20	.63	.09	.00	108.31	350.00
*	321.000	1900.00	133.37	.00	-.20	.00	77.74	50.00
*	321.000	1480.00	134.11	.74	-.09	.00	91.71	50.00
	895.000	1900.00	133.95	.00	.58	.00	72.07	574.00
	895.000	1480.00	134.35	.40	.24	.00	74.33	574.00
*	945.000	1900.00	133.74	.00	-.21	.00	43.91	50.00
*	945.000	1480.00	134.25	.50	-.11	.00	43.92	50.00
*	960.000	1900.00	133.90	.00	.15	.00	46.99	15.00
*	960.000	1480.00	134.32	.42	.07	.00	47.00	15.00
	1058.000	1900.00	133.94	.00	.04	.00	46.99	98.00
	1058.000	1480.00	134.33	.39	.02	.00	46.99	98.00
	1078.000	1900.00	133.80	.00	-.14	.00	41.98	20.00
	1078.000	1480.00	134.26	.46	-.07	.00	41.99	20.00
*	1100.000	1900.00	137.29	.00	3.49	.00	53.32	17.00
*	1100.000	1480.00	136.69	-.60	2.43	.00	50.01	17.00
*	1165.000	1900.00	139.48	.00	2.19	.00	69.77	65.00
*	1165.000	1480.00	139.00	-.48	2.31	.00	66.55	65.00
*	1260.000	1900.00	141.82	.00	2.33	.00	92.09	95.00
*	1260.000	1480.00	141.24	-.58	2.24	.00	87.30	95.00

1360.000	1900.00	142.61	.00	.79	.00	95.72	100.00
1360.000	1480.00	142.05	-.56	.81	.00	89.63	100.00
1460.000	1900.00	143.57	.00	.96	.00	107.90	100.00
1460.000	1480.00	143.03	-.55	.98	.00	102.37	100.00
1562.000	1900.00	144.39	.00	.82	.00	106.16	98.00
1562.000	1480.00	143.89	-.50	.86	.00	101.56	98.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1660.000	1900.00	145.20	.00	.81	.00	105.35	102.00
	1660.000	1480.00	144.70	-.50	.81	.00	97.97	102.00
	1760.000	1900.00	146.23	.00	1.03	.00	111.37	100.00
	1760.000	1480.00	145.73	-.50	1.03	.00	105.09	100.00
	1960.000	1900.00	147.98	.00	1.75	.00	107.65	200.00
	1960.000	1480.00	147.52	-.46	1.79	.00	104.32	200.00
*	2100.000	1900.00	149.07	.00	1.08	.00	104.71	40.00
*	2100.000	1480.00	148.66	-.40	1.14	.00	98.75	40.00
*	2275.000	1900.00	151.10	.00	2.04	.00	276.04	175.00
*	2275.000	1480.00	150.70	-.40	2.04	.00	265.95	175.00
*	2435.000	1900.00	151.55	.00	.44	.00	264.74	160.00
*	2435.000	1480.00	151.29	-.25	.59	.00	252.40	160.00
	2560.000	1900.00	152.93	.00	1.39	.00	274.32	125.00
	2560.000	1480.00	152.75	-.19	1.45	.00	264.83	125.00
	2685.000	1900.00	154.02	.00	1.08	.00	268.23	125.00
	2685.000	1480.00	153.79	-.23	1.04	.00	256.69	125.00
	2885.000	1900.00	156.09	.00	2.07	.00	284.49	200.00
	2885.000	1480.00	155.90	-.18	2.11	.00	274.14	200.00
	3035.000	1900.00	158.63	.00	2.54	.00	284.70	250.00
	3035.000	1480.00	158.42	-.21	2.52	.00	276.80	250.00
	3335.000	1900.00	161.43	.00	2.80	.00	260.13	300.00
	3335.000	1480.00	161.22	-.21	2.80	.00	250.11	300.00
	3535.000	1900.00	163.09	.00	1.67	.00	263.29	200.00
	3535.000	1480.00	162.85	-.24	1.63	.00	251.61	200.00
*	3710.000	1900.00	166.11	.00	3.01	.00	210.83	175.00
*	3710.000	1480.00	165.80	-.31	2.95	.00	198.24	175.00
*	3815.000	2000.00	167.00	.00	.90	.00	152.05	105.00
	3815.000	1480.00	166.61	-.39	.81	.00	121.07	105.00
*	3975.000	2200.00	168.94	.00	1.94	.00	215.74	160.00
*	3975.000	1480.00	168.46	-.48	1.85	.00	200.51	160.00
	4105.000	2400.00	170.06	.00	1.11	.00	186.35	130.00
	4105.000	1480.00	169.64	-.42	1.17	.00	174.91	130.00
*	4315.000	2600.00	172.60	.00	2.54	.00	208.97	210.00
*	4315.000	1480.00	172.02	-.57	2.39	.00	200.37	210.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH

*	4530.000	2800.00	174.97	.00	2.38	.00	204.84	215.00
	4530.000	1480.00	173.98	-.99	1.96	.00	98.33	215.00
*	4700.000	2800.00	176.43	.00	1.46	.00	228.93	170.00
*	4700.000	1480.00	175.42	-1.02	1.43	.00	122.87	170.00
*	4840.000	3000.00	177.32	.00	.89	.00	156.84	140.00
*	4840.000	1440.00	175.89	-1.43	.47	.00	48.44	140.00
*	5065.000	3000.00	179.94	.00	2.62	.00	207.21	225.00
	5065.000	1440.00	177.98	-1.96	2.09	.00	39.90	225.00
	5360.000	3000.00	182.51	.00	2.57	.00	138.69	295.00
*	5360.000	1440.00	181.39	-1.12	3.42	.00	99.43	295.00
	5710.000	3000.00	185.67	.00	3.15	.00	73.80	350.00
	5710.000	1440.00	183.70	-1.97	2.31	.00	50.93	350.00
	6060.000	2700.00	189.03	.00	3.36	.00	134.76	350.00
	6060.000	1440.00	186.58	-2.44	2.88	.00	53.31	350.00
*	6430.000	2700.00	191.27	.00	2.24	.00	72.83	370.00
	6430.000	1440.00	189.45	-1.82	2.87	.00	36.08	370.00
*	6665.000	2700.00	194.45	.00	3.18	.00	112.59	235.00
	6665.000	1440.00	191.87	-2.58	2.42	.00	46.24	235.00
	6885.000	2700.00	195.89	.00	1.45	.00	76.11	220.00
	6885.000	1440.00	193.28	-2.61	1.41	.00	53.24	220.00
*	7041.000	2700.00	196.46	.00	.57	.00	40.55	156.00
*	7041.000	1440.00	194.21	-2.25	.93	.00	31.99	156.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
WARNING SECNO=    321.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    321.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    945.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    945.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    960.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    960.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   1100.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1100.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1100.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   1100.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1100.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1100.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   1165.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1165.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   1165.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   1165.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

WARNING SECNO=   1260.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   1260.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   2100.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2100.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2100.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   2100.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2100.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2100.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
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WARNING SECNO=   2275.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   2275.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   2435.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=   2435.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2435.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=   3710.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3710.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3710.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   3710.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3710.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3710.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   3815.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3815.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=   3975.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3975.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3975.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
         1
   09MAR00       08:52:54                                                    PAGE   14


CAUTION SECNO=   3975.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=   4315.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4315.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4315.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=   4315.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4315.000  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4315.000  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4530.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4530.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=   4700.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=   4700.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   4840.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4840.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
WARNING SECNO=   4840.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   5065.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   5065.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=   5360.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   6430.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   6665.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=   7041.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   7041.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   7041.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   7041.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY
```

THOMPOST.DAT

```
1*****************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    29MAR00    TIME   09:38:16  *
*****************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616-4687     *
*          (916) 756-1104           *
*************************************
```

Post- Project Conditions Model

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
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THIS RUN EXECUTED 29MAR00 09:38:16

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
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```
T1  THOMPSON CREEK POST-PROJECT RUN 1% FLOW; SCVWD
T2  RUN FROM AS-BUILT (5/90) STA 6+60 TO 69+25 WITH FIA X-S'S AT START AND END
T3  SWSEL FROM FIA SILVER CK. RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

              2.00                                                                  132.8

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.00            -1.0000                                     -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

       150

J5  LPRNT     NUMSEC                      ********REQUESTED SECTION NUMBERS********

     -10      -10

J6  IHLEQ     ICOPY     SUBDIV    STRTDS    RMILE

        1


QT        2      2000.      2080
NC     .030       .030       .035        .3         .5
X1    30262          8        950      1060        125        125        125
GR    132.0        950        130       962      125.0        972      122.7        978      122.7       1035
GR      125       1042        130      1050      131.6       1060

QT        2      3300       2080
NC                           .030         .1         .2
X1    30947          7        959      1038        685        685        685
GR    132.7        900        132       959      122.8        978      122.8       1023        131       1038
GR      132       1090        134      1100

QT        2      3600       2080
X1    31447          8        955      1042        500        500        500
GR    134.3        850      133.8       955      122.9        972      122.9       1023        124       1033
GR      132       1042        134      1095        136       1110
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QT        2       3000       1480
          STA 2+71 AND STA 3+21 FROM FIA RUN IN WWMM
X1      271          7        958       1048        350         350         350
GR      135.       900.      134.        958.      122.        980.        122.       1035.       134.       1048.
GR      136.      1115.      138.       1133.

X1      321          7        960       1041         50          50          50
GR      135.       900.      134.        960.      126.7        978.       126.7       1021.       134.       1041.
GR      136.      1110.      138.       1130.

          THOMPSON CRK 660 FT U/S OF NORWOOD CREEK -- BEGIN 1991 AS-BUILT RUN
X1      660.         11        970       1172      339.00      339.00      339.00        0.00        0.64       0.00
GR      137         970       134.5       970        131         982         131        1000         121        1020
GR      121        1080         131       1100        131        1100         131        1120         131        1120
GR      137        1172

NC    0.0500     0.05000    0.05000    0.00000    0.00000
          BEGIN ROCK LINING
X1      805        0.00       0.00       0.00     145.00      145.00      145.00        0.00        0.19       0.00


X1      855        0.00       0.00       0.00      50.00       50.00       50.00        0.00        0.06       0.00

NC    0.0130     0.01300    0.01300    0.00000    0.00000
          BEGIN CONCRETE LINING
X1      885.         8        964       1120       30.00       30.00       30.00         .00         .00        .00
GR      139.5      964        138.5      984        138.4       1000        121.9      1000.01      121.9      1060.01
GR      138.4   1060.02       138.5      1080       141.5       1120          0           0           0          0


X1      886.         8        964       1120        1.00        1.00        1.00         .00         .00        .00
GR      139.3      964        138.3      984        138.4       1000        119.4      1000.01      119.4      1060.01
GR      138.4   1060.02       138.8      1080       142.8       1120          0           0           0          0


X1      918.        11        980       1080.5      22.00       22.00       22.00         .00         .00        .00
GR      141.5      960        139.5      964        139.5        980        129.5       1000        119.9      1000.01
GR      119.9   1060.01       129.5   1060.02         139       1080          140      1080.5          140       1096
GR        144     1110           0          0           0          0            0           0           0          0

          DROP STRUCTURE D/S OF QUIMBY
X1      919.         4     1000.00    1060.02        1.00        1.00        1.00         .00         .00        .00
GR      138.5      1000       129.5    1000.01       129.5     1060.01       138.5     1060.02           0          0


X1      920.         4     1000.00    1060.02        1.00        1.00        1.00         .00         .00        .00
GR      138.5      1000       126.5    1000.01       126.5     1060.01       138.5     1060.02           0          0
        1
   29MAR00      09:38:16                                                                                  PAGE    3



X1      928.         4     1000.00    1060.02        8.00        8.00        8.00         .00         .00        .00
GR      138.5      1000       126.5    1000.01       126.5     1060.01       138.5     1060.02           0          0


X1      946.         4     1000.00    1044.01       18.00       18.00       18.00         .00         .00        .00
GR      138.5      1000       126.5    1000.01       126.5     1044.01       138.5     1044.02           0          0

          D/S FACE TRIPLE 12X12 RCB AT QUIMBY
X1      961.        12     1000.00    1038.06       15.00       15.00       15.00         .00         .00        .00
GR      138.5      1000       126.5    1000.01       126.5     1012.02       138.5     1012.02       138.5    1013.02
GR      126.5   1013.03       126.5    1025.03       138.5     1025.04       138.5     1026.04       126.5    1026.05
GR      126.5   1038.05       138.5    1038.06           0           0           0           0           0          0

          U/S FACE OF QUIMBY CULVERT. BEGIN LEVEE RAISING.
X1     1061        0.00       0.00       0.00      100.00      100.00      100.00        0.00       00.28       0.00


X1     1077.        12     1000.00    1045.06       16.00       16.00       16.00         .00         .00        .00
GR      143.8      1000       127.2    1000.01       127.2     1015.51         132     1015.52         132    1016.52
GR      127.2   1016.53       127.2    1028.53         132     1028.54         132     1029.54       127.2    1029.55
GR      127.2   1045.05       143.8    1045.06           0           0           0           0           0          0

X1     1088.        14     1000.00       1098       11.00       11.00       11.00         .00         .00        .00
GR      142.5      960       142.5        976       142.5        1000        140.9      1003.4       135.4      1008.9
GR      135.3   1025.9       127.4    1025.91       127.4     1070.91       135.3     1070.92       135.3    1087.92
GR      140.8   1093.42         143       1098         143        1154         143        1190           0          0
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        (TCL-STA 10+16 OR TCR-STA 10+45)
X1    1105.          17         996        1108       17.00       17.00       17.00         .00         .00         .00
X3       10
GR     143          957         143         977       143.9         980       143.9         996       142.9        1000
GR   140.9       1003.4       135.4      1008.9       135.4      1025.9       127.7     1025.91       127.7     1070.91
GR   135.4       1070.92      135.4      1087.92      140.9      1093.42      142.9     1096.82       143        1108
GR     143         1136         143         1192           0           0           0           0           0           0

        (TCL-STA 10+17 OR TCR-STA 10+47)  DROP STRUCTURE U/S OF QUIMBY RD
X1    1106.          12        996.0      1097.6        1.00        1.00        1.00         .00         .00         .00
X3       10
GR     143          952         143         976        144         980         144         996       142.8        1000
GR   140.9       1003.8       135.4      1009.3       135.4      1088.3       140.9     1093.8        143.0     1097.6
GR     143         1104         143         1192           0           0           0           0           0           0

        (TCL-STA 10+45 OR TCR-STA 10+74)
X1    1133.          19         980        1130       27.00       27.00       27.00         .00         .00         .00
X3       10
GR     143          948         143         952        143         956       146.1         965       146.1         980
GR     143          985         143        1001       140.9       1003       135.4      1008.5       135.4     1087.5
GR   140.9          1093       142.5       1096        143        1100        143         1125       146.5        1130
GR   146.5          1141        143        1146        143        1160        143         1192           0           0
       1
   29MAR00       09:38:16                                                                                    PAGE     4


        (TCL-STA 10+46 OR TCR-STA 10+76)
X1    1134.          21         987        1137        1.00        1.00        1.00         .00         .00         .00
X3       10
GR     143          951         143         965       146.1         971       146.1         987        143         992
GR   142.5          1000       140.9       1003       136.9      1008.5       136.9     1033        135.9        1048
GR   136.9          1063       136.9      1087.5       140.9      1093        142.5     1096        143         1124
GR     143         1132        146.5       1137       146.5      1148         143      1153        143         1161
GR     143         1196           0           0           0           0           0           0           0           0

        (TCL-STA 10+48 OR TCR-STA 10+79)
X1    1136.          19         986        1140        2.00        2.00        2.00         .00         .00         .00
X3       10
GR     143          956         143         964        144         966       146.1         970       146.1         986
GR     143          992       142.5       1000       140.9       1003       135.4      1008.5       135.4     1087.5
GR   140.9          1093       142.5       1096        143        1099        143         1119        143         1135
GR   146.5          1140       146.5       1155       143.3       1162       143.3       1192           0           0

NC  0.0450     0.04500     0.04500     0.00000     0.00000
        (TCL-STA 10+56 OR TCR-STA 10+86)  START ROCK TRANSITION
X1    1144.          18         986        1138        8.00        8.00        8.00         .00         .00         .00
X3       10.
GR   143.5          938        143.5        965       146.1         970       146.1         986       143.5         992
GR   143.5          1000        141         1005       135.5      1010.5       135.5     1089.5        141         1095
GR   143.5          1100       143.5       1133       146.5      1138        146.5       1139       146.5        1142
GR   143.5          1148       143.5       1156       143.5       1192           0           0           0           0

        (TCL-STA 11+22 OR TCR-STA 11+65)  END ROCK TRANSITION. BEGIN ROCK SIDES
X1    1212.          23         993        1119       68.00       68.00       68.00         .00         .00         .00
X3       10.
GR     144          826         144         846        144         932         144         940        146          948
GR     146          976       146.4         977       146.4        993         144         999        144         1000
GR   140.5       1010.5       140.5      1016         136.5      1028         136       1054.5       136.5     1088
GR   140.5          1100       140.5      1105.5       141.9      1110        146.7       1119       146.7        1134
GR   144.5          1147       144.5       1158       144.5       1194           0           0           0           0

        (TCL-STA 13+52 OR TCR-STA 14+20)  BEGIN TRANSITION ROCK SIDES
X1     1462          23         993        1119      250.00      250.00      250.00
X3       10.
GR   146.4          826        146.4        846       146.4         932       146.4         940       147.6         948
GR   147.6          976        148.0        977       148.0         993       146.4         999       146.4        1000
GR   142.9       1010.5        142.9      1016         138.9      1028         138.4     1054.5       138.9     1088
GR   142.9          1100       142.9      1105.5       144.3      1110        147.7       1119       147.7        1134
GR   146.9          1147       146.9       1158       146.9       1194

                                        END TRANSITION ROCK SIDES AND
                                        START LOW FLOW CHANNEL
        (TCL-STA 14+46 OR TCR-STA 15+30)
X1    1565.          20       998.00       1136       103.00      103.00      103.00         .00         .00         .00
X3       10.
GR     145          888         145         912        146         914       147.5         919       147.5         979
GR     149          982         149         998       147.4        1000       142.4       1009.8      142.4        1038.5
GR   139.9       1043.5       139.4      1064.5       139.9      1093.5       142.4     1098.5        142.4     1123.6
GR   147.4       1133.4       148.9       1136        148.9       1152       145.5       1157        145.5        1160
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         (TCL-STA 16+42 OR TCR-STA 17+30)
X1    1764        20       998       1136      199.00      199.00      199.00
X3      10.
GR   147.1       888     147.1        912      148.1         914      149.6       919      149.6       979
GR   150.9       982     150.9        998      149.5        1000      144.5    1009.8      144.5    1038.5
GR     142    1043.5     141.5     1064.5        142      1093.5      144.5    1098.5      144.5    1123.6
GR   149.5    1133.4     151.1       1136      151.1        1152      147.6      1157      147.6      1160

         (TCL-STA 18+44 OR TCR-STA 19+30)
X1    1964        20       998       1136      200.00      200.00      200.00
X3      10.
GR   149.1       888     149.1        912      150.1         914      151.6       919      151.6       979
GR   152.9       982     152.9        998      151.5        1000      146.5    1009.5      146.5    1038.5
GR     144    1043.5     143.5     1064.5        144      1093.5      146.5    1098.5      146.5    1123.6
GR   151.5    1133.4     153.3       1136      153.3        1152      149.6      1157      149.6      1160

         (TCL-STA 19+84 OR TCR-STA 20+67)
X1    2104        20       998       1136      140.00      140.00      140.00
X3      10.
GR   150.6       888     150.6        912      151.6         914      153.1       919      153.1       979
GR   154.3       982     154.3        998        153        1000        148    1009.5        148    1038.5
GR   145.5    1043.5       144     1064.5      145.5      1093.5        148    1098.5        148    1123.6
GR     153    1133.5     154.8       1136      154.8        1152      151.1      1157      151.1      1160

NC                                    0.1
         (TCL-STA 20+18 OR TCR-STA 21+17)  END OF LOW FLOW CHANNEL AND
                                           BEGIN ROCK TRANSITION
X1    2164        17      1030       1192         60          60          60          0          0          0
X3      10.
GR     149       964       149        996      150.4        1000      154.7    1008      154.7       1030
GR     148    1042.4       148       1059      145.4        1064      144.3    1080      145.4       1105
GR     148      1110       148     1179.6      155.4        1192      155.4    1208      154.3       1209
GR   149.3      1219     149.3       1223          0           0          0       0          0          0

NC   .0352     .0352     .0352
                                  BEGIN MODIFIED FLOOD PLAIN
                                  END ROCK LINED TRANSITION (CHANGE N)
                                  ROUGHNESS IS 0.06 FOR THE
                                  CHANNEL AND 0.03 FOR THE FLOODPLAIN.
                                  COMPOSITE ROUGHNESS = 0.0352
                                  EXPANSION LOSS COEFFICIENT = 0.1
         (TCL-STA 20+32 OR TCR-STA 21+38)
X1    2189.        21       900       1090        25.00       25.00       25.00        .00        .00        .00
X3      10.
GR     148       778       148        870      148.5         873      154.8       985      154.8       900
GR   148.4       920       148        924      148.5         944      150.4       963      149.9       974
GR   149.9       979     147.5        990      144.4        1000      147.3    1005.5        150    1015.5
GR   149.5      1024     147.9       1080      155.6        1090      155.6    1106.5      146.5    1122.5
GR   147.8      1125         0          0          0           0          0       0          0          0
       1
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         STATION ADDED 4/90 BY DN FROM SURVEY DATA TO DESCRIBE EXPANSION
X1    2275        13       863       1151          25          25          25
GR   155.3       850     155.3        863      149.1         876      148.5       912      150.4       983
GR     147       993     145.0        998      145.0        1002        151    1019.5      149.3    1060.5
GR     149      1141     155.3       1151      155.3        1175          0       0          0          0

         (TCL-STA 22+97 OR TCR-STA 23+67)  ADDED 5/87 BY MJK FROM SURVEY DATA
X1    2375.        24       850       1149         100         100         100        .00        .00        .00
X3      10
GR   149.5       751     149.5        755      149.8         800         150       823      156.1       835
GR   156.1       850     150.3        861      150.4         878       150.3       910      150.5       942
GR   151.5     959.4       152      973.6        152       982.3       149.5       992      146.8      1000
GR   150.3      1010     151.4       1018        151        1037       150.5    1065.8        150      1139
GR   156.3      1149     156.3       1164        150        1172         150    1178.5          0          0

         (TCL-STA 23+95 OR TCR-STA 24+65)  BY MJK FROM SURVEY DATA
X1    2475.        24       850       1149      100.00      100.00      100.00        .00        .00        .00
X3      10
GR   149.5       748     149.5        752      149.8         800         150       823      156.7       835
GR   156.7       850     150.3        861      150.4         878       150.3       910      150.5       942
GR   151.5     959.4       152      973.6        152       982.3       149.5       992      147.8      1000
GR   150.3      1010     151.4       1018        151        1037       150.5    1065.8        150      1139
GR   156.9      1149     156.9       1164        150        1174         150    1175.5
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          (TCL-STA 24+88 OR TCR-STA 25+62)  ADDED 5/87 BY MJK FROM SURVEY DATA
X1    2570.         20        860       1160       95.00      95.00      95.00        .00        .00        .00
X3      10.
GR    151.5        789      151.5        797      151.5        833      157.1        845      157.1        860
GR    151.5        875      151.3        883        152        911        152        947      152.8        968
GR      153        976      152.5      985.8      149.0       1000      152.5       1010        152       1091
GR      152       1145      157.8       1160      157.8       1176      152.4       1185      152.4       1191

          (TCL-STA 25+85 OR TCR-STA 26+56)
X1    2667.         17        865       1170       97.00      97.00      97.00        .00        .00        .00
X3       10      +0.00      +0.00        .00         .00        .00        .00      +0.00      +0.00
GR      153        799        153        839      158.4        848      158.4        865        153        880
GR    153.5        972      153.5        986        151       1000        150       1006        153       1014
GR    153.5       1046        153       1060        153       1160      158.7       1170      158.7       1187
GR      153       1196        153       1203          0          0          0          0          0          0

          (TCL-STA 30+91 OR TCR-STA 31+71)
X1    3180.         19        862       1162     513.00     513.00     513.00        .00        .00        .00
X3       10      +0.00      +0.00                                                  +0.00      +0.00
GR      158        818        158        838      163.9        846      163.9        862        158        869
GR      159        966        159        985      155.5        990      153.5       1000        156       1005
GR      160       1015        160       1026        159       1056        159       1157      163.8       1162
GR    163.8       1179        158       1187        159       1187        159       1191          0          0
        1
   29MAR00       09:38:16                                                                                PAGE    7


          (TCL-STA 33+95 OR TCR-STA 34+83)  ADDED 5/87 BY MJK FROM SURVEY DATA
X1    3494.         23        881       1172     314.00     314.00     314.00        .00        .00        .00
X3      10.
GR      160        844        160        852      167.8        865      167.8        881      166.5        882
GR    161.8      895.4      161.9      916.5        162      937.7      162.5      956.4      162.5      972.9
GR    162.5      979.2      161.9        985      158.4      995.6      155.9       1000        158     1005.9
GR    159.5       1016      162.9       1022      161.4       1157      166.5       1171      167.2       1172
GR    167.2       1188        161       1200        161       1204          0          0          0          0

NC    0.032      0.032      0.032    0.00000    0.00000
                                    CHANGED 5/87 BY MJK FROM SURVEY DATA
                                    (DEEPER CHANNEL N=0.05)
                                    ROUGHNESS IS 0.05 FOR THE CHANNEL
                                    AND 0.025 FOR THE FLOODPLAIN.
                                    COMPOSITE ROUGHNESS = 0.032
          (TCL-STA 35+98 OR TCR-STA 37+00)
X1    3700.         19        853       1076     206.00     206.00     206.00        .00        .00        .00
X3       10      +0.00      +0.00                                                  +0.00      +0.00
GR    162.4        813      162.4        824      170.5        837      170.5        853        164        865
GR    164.4        865      164.4        873      164.3        972      163.5        987        158        996
GR    157.9       1004      163.5       1013      164.4       1022        164       1062      167.5       1071
GR    169.6       1076      169.6       1082        166       1094        166       1097          0          0

          (TCL-STA 40+46 OR TCR-STA 42+69)  D/S FUTURE EVERDALE DRIVE &
                                    EXISTING FOOT BRIDGE
                                    CHANGED 5/87 MJK FROM SURVEY DATA.
                                    1% Q CHANGES
X1    4335.         19        797       1016     450.00     550.00     635.00        .00        .00        .00
X3       10      +0.00      +0.00                                                  +0.00      +0.00
GR      169        757        169        769      176.3        781      176.3        797        174        798
GR      171        807        171        923        170        973        169        989        161        997
GR    160.5       1000      160.5       1002        171       1012        173       1013      175.9       1016
GR    175.9       1019        173       1023        169       1039      168.8       1051          0          0

          (TCL-STA 45+13 OR TCR-STA 47+64)  CHANGED 5/87 MJK FROM SURVEY DATA
X1    4880.         19        877       1080     500.00     500.00     545.00        .00        .00        .00
X3       10      +0.00      +0.00                                                  +0.00      +0.00
GR      176        850        176        853      180.5        869      180.5        877      176.5        890
GR    176.5        898      176.5        912        175        957      170.9        965      167.3        983
GR      164        984      163.4        993      168.5        995        176        998      177.3       1053
GR      181       1080        181     1081.5      178.4       1112      178.3       1121          0          0

          (TCL-STA 52+23 OR TCR-STA 53+90)  CHANGED 4/90 DN FROM SURVEY DATA 9/89
           END DISTRICT PROJECT
X1    5600.         22        850     1063.8     700.00     625.00     720.00        .00        .00        .00
X3       10      +0.00      +0.00                                                  +0.00      +0.00
GR      185        820        185        836      186.9        844      186.9        850      184.8        857
GR    184.5        865        184        876      183.8        926      183.8        954      183.5        976
GR    174.5        993      171.1        995      171.1       1000      175.1       1010      185.1       1025
GR    184.8       1037      184.9       1052      187.5     1063.8      186.7       1067      186.7       1067
GR    186.2     1067.1      186.8       1081          0          0          0          0          0          0
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QT        2       2700       1440
                      U/S QUIMBY CREEK.
                      CROSS SECTIONS LOOK DOWNSTREAM
X1    6085.         14        806       1032      350.00      350.00      485.00         .00         .00         .00
X3       10      +0.00      +0.00                                                     +0.00       +0.00
GR    188.5        785       188.5        791         191         795         191         806       188.5         808
GR    188.5        980         179        989       177.5         994         178        1000         178        1010
GR    188.5       1022         191       1032         191        1034         191        1037           0           0

        TCR STA 265+60 P STA 40+40 CHANGED 5/87 MJK FROM SURVEY DATA. END RT LEV
          END POST-PROJECT AS-BULIT SURVEY RUN
X1    6607.         15        898    1011.00      425.00      470.00      522.00         .00         .00         .00
X3       10      +0.00      +0.00                                                     +0.00       +0.00
GR    193.3        878       193.3        886         195         890         195         898       193.3         900
GR    193.3        908         193        936       191.8         964       191.8         964         186         973
GR      183        986         183       1000         194        1011         194        1020       193.5        1031

        X-S FROM FIA RUN; SILVER CK/ THOMPSON CK.
X1    6885.          9        958       1035      278.00      278.00      278.00         .00         .00         .00
GR    196.3        920         196        958         192         980         186         992       185.5        1000
GR    186.0       1008       192.0       1022       196.0        1035         198        1085

        X-S FROM FIA RUN; LAST X-S
X1     7041          9        978       1020         156         156         156
GR    200.       962.      198.       978.       188.        995.       187.7      1000.       188.       1002.
GR    190.       1008.     196.       1020.      198.        1025.      199.       1040.
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IHLEQ = 1.  THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF
PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH.  SEE DOCUMENTATION FOR
DETAILS.
       1
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T1  THOMPSON CREEK POST-PROJECT RUN 10% FLOW; SCVWD
T2  RUN FROM AS-BUILT (5/90) STA 6+60 TO 69+25 WITH FIA X-S'S AT START AND END
T3  SWSEL FROM FIA SILVER CK. RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

            3.00                                                                  133.96

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

   2.00            -1.0000                                       -1

IHLEQ = 1.  THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF
PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH.  SEE DOCUMENTATION FOR
DETAILS.
       1
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                                                                  THIS RUN EXECUTED 29MAR00    09:38:28
************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2:  May 1991
************************************

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

L FROM FIA SILVER CK. RU

SUMMARY PRINTOUT TABLE  150

      SECNO      XLCH      ELTRD      ELLC      ELMIN        Q       CWSEL      CRIWS      EG        10*KS      VCH       AREA      .01K
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30262.000	.00	.00	.00	122.70	2000.00	132.80	125.86	132.89	2.34	2.41	829.05	1308.35
30262.000	.00	.00	.00	122.70	2080.00	133.96	125.95	134.03	1.61	2.17	956.65	1639.07
30947.000	685.00	.00	.00	122.80	3300.00	132.85	127.89	133.21	6.41	4.91	746.30	1303.36
30947.000	685.00	.00	.00	122.80	2080.00	134.05	126.61	134.14	1.37	2.49	985.32	1775.12
31447.000	500.00	.00	.00	122.90	3600.00	133.16	127.61	133.51	5.72	4.79	766.38	1505.31
31447.000	500.00	.00	.00	122.90	2080.00	134.11	126.23	134.21	1.33	2.45	902.18	1805.84
271.000	350.00	.00	.00	122.00	3000.00	133.46	126.34	133.67	3.09	3.65	821.91	1705.94
271.000	350.00	.00	.00	122.00	1480.00	134.20	124.75	134.24	.60	1.67	889.47	1914.26
* 321.000	50.00	.00	.00	126.70	3000.00	132.88	131.49	133.93	34.72	8.21	365.47	509.15
* 321.000	50.00	.00	.00	126.70	1480.00	134.12	129.81	134.28	4.29	3.20	462.63	714.74
* 660.000	339.00	.00	.00	121.64	3000.00	134.06	125.70	134.16	2.09	2.57	1168.62	2073.27
* 660.000	339.00	.00	.00	121.64	1480.00	134.29	124.22	134.32	.47	1.22	1208.86	2169.08
* 805.000	145.00	.00	.00	121.83	3000.00	134.11	125.88	134.22	6.12	2.62	1146.38	1212.46
* 805.000	145.00	.00	.00	121.83	1480.00	134.31	124.41	134.33	1.38	1.26	1178.85	1258.51
855.000	50.00	.00	.00	121.89	3000.00	134.14	125.95	134.25	6.21	2.63	1139.96	1203.42
855.000	50.00	.00	.00	121.89	1480.00	134.31	124.47	134.34	1.41	1.27	1169.57	1245.31
* 885.000	30.00	.00	.00	121.90	3000.00	134.02	126.15	134.29	.73	4.12	727.35	3499.41
* 885.000	30.00	.00	.00	121.90	1480.00	134.28	124.56	134.35	.17	1.99	743.18	3612.17
886.000	1.00	.00	.00	119.40	3000.00	134.11	123.65	134.29	.42	3.40	882.98	4645.61
886.000	1.00	.00	.00	119.40	1480.00	134.31	122.06	134.35	.10	1.65	894.46	4733.21
918.000	22.00	.00	.00	119.90	3000.00	134.12	124.16	134.30	.46	3.35	896.84	4417.59
918.000	22.00	.00	.00	119.90	1480.00	134.31	122.56	134.35	.11	1.62	911.94	4516.19

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	919.000	1.00	.00	.00	129.50	3000.00	133.75	133.75	135.90	18.34	11.76	255.08	700.53
*	919.000	1.00	.00	.00	129.50	1480.00	133.96	132.16	134.44	3.82	5.52	267.91	757.08
*	920.000	1.00	.00	.00	126.50	3000.00	135.60	130.75	136.07	1.73	5.50	545.84	2279.15
*	920.000	1.00	.00	.00	126.50	1480.00	134.31	129.15	134.47	.67	3.16	468.85	1808.73
	928.000	8.00	.00	.00	126.50	3000.00	135.60	130.75	136.07	1.73	5.49	546.43	2282.86
	928.000	8.00	.00	.00	126.50	1480.00	134.31	129.16	134.47	.67	3.16	468.92	1809.16
	946.000	18.00	.00	.00	126.50	3000.00	135.22	131.74	136.17	3.31	7.82	383.86	1648.16
	946.000	18.00	.00	.00	126.50	1480.00	134.20	129.77	134.50	1.19	4.37	338.93	1356.94
*	961.000	15.00	.00	.00	126.50	3000.00	134.72	132.48	136.31	14.93	10.13	296.29	776.49
*	961.000	15.00	.00	.00	126.50	1480.00	134.08	130.24	134.53	4.49	5.42	272.97	698.68
	1061.000	100.00	.00	.00	126.78	3000.00	134.81	132.76	136.48	15.88	10.37	289.20	752.74
	1061.000	100.00	.00	.00	126.78	1480.00	134.10	130.50	134.59	4.90	5.61	263.90	668.69
*	1077.000	16.00	.00	.00	127.20	3000.00	135.50	132.56	136.56	6.97	8.24	364.23	1136.14
	1077.000	16.00	.00	.00	127.20	1480.00	134.25	130.51	134.61	2.85	4.81	307.71	876.01
	1088.000	11.00	.00	.00	127.40	3000.00	135.59	132.56	136.57	7.70	7.94	377.96	1081.12
	1088.000	11.00	.00	.00	127.40	1480.00	134.25	130.61	134.61	1.93	4.80	308.33	1065.03
	1105.000	17.00	.00	.00	127.70	3000.00	135.50	132.86	136.61	9.42	8.46	354.61	977.59
	1105.000	17.00	.00	.00	127.70	1480.00	134.22	130.92	134.62	2.24	5.04	293.66	989.26
*	1106.000	1.00	.00	.00	135.40	3000.00	138.89	138.89	140.58	17.41	10.43	287.50	718.94
*	1106.000	1.00	.00	.00	135.40	1480.00	137.59	137.59	138.67	19.89	8.32	177.79	331.89
	1133.000	27.00	.00	.00	135.40	3000.00	139.35	138.89	140.65	11.56	9.17	326.99	882.39
	1133.000	27.00	.00	.00	135.40	1480.00	137.96	137.59	138.74	11.63	7.05	309.90	434.03
*	1134.000	1.00	.00	.00	135.90	3000.00	140.19	140.19	141.85	17.37	10.36	289.49	719.79
*	1134.000	1.00	.00	.00	135.90	1480.00	138.89	138.89	139.97	20.05	8.32	177.89	330.53
*	1136.000	2.00	.00	.00	135.40	3000.00	141.44	138.89	141.97	2.83	5.85	513.03	1782.58
*	1136.000	2.00	.00	.00	135.40	1480.00	139.80	137.59	140.05	1.96	4.04	366.61	1057.70
*	1144.000	8.00	.00	.00	135.50	3000.00	141.44	139.00	141.99	35.58	5.94	505.28	502.97
*	1144.000	8.00	.00	.00	135.50	1480.00	139.80	137.69	140.06	25.13	4.13	358.73	295.24

*	1212.000	68.00	.00	.00	136.00	3000.00	141.60	140.21	142.43	77.42	7.29	411.43	340.95
*	1212.000	68.00	.00	.00	136.00	1480.00	139.91	138.82	140.44	68.76	5.84	253.59	178.48
	1462.000	250.00	.00	.00	138.40	3000.00	143.69	142.60	144.66	98.53	7.90	379.66	302.23
	1462.000	250.00	.00	.00	138.40	1480.00	141.91	141.22	142.59	101.35	6.64	223.00	147.01
	1565.000	103.00	.00	.00	139.40	3000.00	144.87	143.85	145.58	78.19	6.76	443.63	339.27
	1565.000	103.00	.00	.00	139.40	1480.00	143.21	142.83	143.78	129.57	6.08	243.61	130.02

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	1764.000	199.00	.00	.00	141.50	3000.00	146.60	145.95	147.48	109.61	7.52	398.82	286.54
	1764.000	199.00	.00	.00	141.50	1480.00	145.51	144.90	145.99	95.92	5.53	267.41	151.11
	1964.000	200.00	.00	.00	143.50	3000.00	148.74	147.95	149.55	97.39	7.24	414.16	303.99
	1964.000	200.00	.00	.00	143.50	1480.00	147.48	146.90	147.97	101.73	5.63	262.79	146.74
	2104.000	140.00	.00	.00	144.00	3000.00	150.09	149.23	150.87	91.27	7.12	421.62	314.01
	2104.000	140.00	.00	.00	144.00	1480.00	148.84	148.17	149.30	88.89	5.42	273.24	156.98
	2164.000	60.00	.00	.00	144.30	3000.00	150.82	149.39	151.29	50.28	5.52	543.19	423.07
	2164.000	60.00	.00	.00	144.30	1480.00	149.43	148.44	149.72	54.85	4.34	341.05	199.83
*	2189.000	25.00	.00	.00	144.40	3000.00	150.85	150.85	151.89	139.74	8.18	366.87	253.78
*	2189.000	25.00	.00	.00	144.40	1480.00	149.91	149.91	150.67	179.78	7.03	210.66	110.38
*	2275.000	25.00	.00	.00	145.00	3000.00	151.81	150.67	152.08	26.65	4.13	726.54	581.09
*	2275.000	25.00	.00	.00	145.00	1480.00	150.69	149.97	150.88	36.88	3.50	423.27	243.70
*	2375.000	100.00	.00	.00	146.80	3000.00	152.22	151.95	152.80	105.50	6.16	487.10	292.07
*	2375.000	100.00	.00	.00	146.80	1480.00	151.43	151.30	151.88	152.66	5.42	273.21	119.78
*	2475.000	100.00	.00	.00	147.80	3000.00	153.03	152.08	153.31	30.44	4.33	709.09	543.71
*	2475.000	100.00	.00	.00	147.80	1480.00	152.23	151.35	152.37	27.09	3.09	478.62	284.37
*	2570.000	95.00	.00	.00	149.00	3000.00	153.54	153.51	154.31	160.53	7.05	425.49	236.78
*	2570.000	95.00	.00	.00	149.00	1480.00	152.96	152.90	153.44	183.92	5.58	265.20	109.13
*	2667.000	97.00	.00	.00	150.00	3000.00	154.88	154.48	155.38	80.08	5.65	530.90	335.24
*	2667.000	97.00	.00	.00	150.00	1480.00	154.25	153.91	154.53	78.17	4.25	348.46	167.40
	3180.000	513.00	.00	.00	153.50	3000.00	160.18	160.10	160.87	140.99	6.65	451.45	252.65
	3180.000	513.00	.00	.00	153.50	1480.00	159.58	159.48	160.00	144.13	5.24	282.62	123.28
	3494.000	314.00	.00	.00	155.90	3000.00	163.64	163.28	164.16	82.98	5.82	515.05	329.32
	3494.000	314.00	.00	.00	155.90	1480.00	162.98	162.65	163.28	81.33	4.39	337.20	164.11
*	3700.000	206.00	.00	.00	157.90	3000.00	165.58	165.58	166.55	128.45	7.87	381.07	264.70
	3700.000	206.00	.00	.00	157.90	1480.00	164.92	164.86	165.49	134.35	6.05	244.51	127.68
	4335.000	635.00	.00	.00	160.50	3000.00	172.18	171.85	172.88	81.06	6.73	445.50	333.22
	4335.000	635.00	.00	.00	160.50	1480.00	171.44	170.65	171.84	79.26	5.07	291.82	166.24
	4880.000	545.00	.00	.00	163.40	3000.00	175.72	173.92	177.30	74.88	10.10	296.99	346.69
*	4880.000	545.00	.00	.00	163.40	1480.00	173.67	171.36	174.45	32.97	7.10	208.42	257.76
*	5600.000	720.00	.00	.00	171.10	3000.00	181.28	181.28	184.12	102.44	13.54	221.60	296.40
*	5600.000	720.00	.00	.00	171.10	1480.00	178.47	178.47	180.64	114.97	11.82	125.26	138.03
	6085.000	485.00	.00	.00	177.50	2700.00	186.05	185.18	188.19	68.96	11.76	229.69	325.13
	6085.000	485.00	.00	.00	177.50	1440.00	183.50	182.92	185.08	74.60	10.09	142.77	166.72

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	6607.000	522.00	.00	.00	183.00	2700.00	190.07	190.06	192.65	98.58	12.88	209.59	271.93
	6607.000	522.00	.00	.00	183.00	1440.00	188.02	187.98	189.88	107.04	10.96	131.38	139.18
	6885.000	278.00	.00	.00	185.50	2700.00	193.28	193.01	195.26	85.55	11.28	239.40	291.92
	6885.000	278.00	.00	.00	185.50	1440.00	191.03	190.86	192.69	94.17	10.34	139.22	148.39
*	7041.000	156.00	.00	.00	187.70	2700.00	196.45	196.45	199.09	98.30	13.04	207.29	272.33
*	7041.000	156.00	.00	.00	187.70	1440.00	194.21	194.21	196.23	108.71	11.39	126.42	138.11

L FROM FIA SILVER CK. RU

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	30262.000	2000.00	132.80	.00	.00	.00	110.00	.00
	30262.000	2080.00	133.96	1.16	.00	.00	110.00	.00
	30947.000	3300.00	132.85	.00	.05	.00	194.24	685.00
	30947.000	2080.00	134.05	1.20	.09	.00	200.00	685.00
	31447.000	3600.00	133.16	.00	.31	.00	116.66	500.00
	31447.000	2080.00	134.11	.96	.06	.00	208.02	500.00
	271.000	3000.00	133.46	.00	.30	.00	88.43	350.00
	271.000	1480.00	134.20	.74	.08	.00	108.00	350.00
*	321.000	3000.00	132.88	.00	-.58	.00	75.19	50.00
*	321.000	1480.00	134.12	1.23	-.08	.00	91.96	50.00
*	660.000	3000.00	134.06	.00	1.17	.00	167.22	339.00
*	660.000	1480.00	134.29	.24	.18	.00	170.10	339.00
*	805.000	3000.00	134.11	.00	.06	.00	165.60	145.00
*	805.000	1480.00	134.31	.19	.01	.00	167.95	145.00
	855.000	3000.00	134.14	.00	.03	.00	165.13	50.00
	855.000	1480.00	134.31	.17	.01	.00	167.28	50.00
*	885.000	3000.00	134.02	.00	-.12	.00	60.01	30.00
*	885.000	1480.00	134.28	.26	-.03	.00	60.02	30.00
	886.000	3000.00	134.11	.00	.09	.00	60.02	1.00
	886.000	1480.00	134.31	.19	.02	.00	60.02	1.00
	918.000	3000.00	134.12	.00	.01	.00	78.96	22.00
	918.000	1480.00	134.31	.19	.00	.00	79.74	22.00
*	919.000	3000.00	133.75	.00	-.37	.00	60.01	1.00
*	919.000	1480.00	133.96	.21	-.35	.00	60.01	1.00
*	920.000	3000.00	135.60	.00	1.85	.00	60.02	1.00
*	920.000	1480.00	134.31	-1.29	.35	.00	60.01	1.00
	928.000	3000.00	135.60	.00	.00	.00	60.02	8.00
	928.000	1480.00	134.31	-1.29	.00	.00	60.01	8.00
	946.000	3000.00	135.22	.00	-.38	.00	44.01	18.00
	946.000	1480.00	134.20	-1.02	-.11	.00	44.01	18.00
*	961.000	3000.00	134.72	.00	-.50	.00	36.04	15.00
*	961.000	1480.00	134.08	-.64	-.12	.00	36.04	15.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	1061.000	3000.00	134.81	.00	.09	.00	36.04	100.00
	1061.000	1480.00	134.10	-.71	.02	.00	36.04	100.00
*	1077.000	3000.00	135.50	.00	.69	.00	45.05	16.00
	1077.000	1480.00	134.25	-1.26	.15	.00	45.05	16.00
	1088.000	3000.00	135.59	.00	.09	.00	79.51	11.00
	1088.000	1480.00	134.25	-1.34	.00	.00	45.02	11.00
	1105.000	3000.00	135.50	.00	-.09	.00	79.22	17.00
	1105.000	1480.00	134.22	-1.28	-.03	.00	45.02	17.00
*	1106.000	3000.00	138.89	.00	3.38	.00	85.97	1.00
*	1106.000	1480.00	137.59	-1.30	3.37	.00	83.38	1.00

	1133.000	3000.00	139.35	.00	.46	.00	86.88	27.00
	1133.000	1480.00	137.96	-1.38	.37	.00	84.15	27.00
*	1134.000	3000.00	140.19	.00	.84	.00	88.04	1.00
*	1134.000	1480.00	138.89	-1.29	.93	.00	84.48	1.00
*	1136.000	3000.00	141.44	.00	1.25	.00	91.99	2.00
*	1136.000	1480.00	139.80	-1.64	.90	.00	87.79	2.00
*	1144.000	3000.00	141.44	.00	.00	.00	91.78	8.00
*	1144.000	1480.00	139.80	-1.64	.00	.00	87.61	8.00
*	1212.000	3000.00	141.60	.00	.16	.00	101.85	68.00
*	1212.000	1480.00	139.91	-1.69	.11	.00	80.39	68.00
	1462.000	3000.00	143.69	.00	2.08	.00	99.89	250.00
	1462.000	1480.00	141.91	-1.78	2.00	.00	78.08	250.00
	1565.000	3000.00	144.87	.00	1.18	.00	123.50	103.00
	1565.000	1480.00	143.21	-1.66	1.30	.00	116.98	103.00
	1764.000	3000.00	146.60	.00	1.73	.00	122.07	199.00
	1764.000	1480.00	145.51	-1.09	2.30	.00	117.77	199.00
	1964.000	3000.00	148.74	.00	2.13	.00	122.71	200.00
	1964.000	1480.00	147.48	-1.26	1.96	.00	117.85	200.00
	2104.000	3000.00	150.09	.00	1.35	.00	122.20	140.00
	2104.000	1480.00	148.84	-1.24	1.37	.00	117.39	140.00
	2164.000	3000.00	150.82	.00	.73	.00	147.15	60.00
	2164.000	1480.00	149.43	-1.39	.59	.00	142.22	60.00
*	2189.000	3000.00	150.85	.00	.03	.00	171.49	25.00
*	2189.000	1480.00	149.91	-.95	.47	.00	149.44	25.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	2275.000	3000.00	151.81	.00	.96	.00	275.16	25.00
*	2275.000	1480.00	150.69	-1.12	.79	.00	262.92	25.00
*	2375.000	3000.00	152.22	.00	.40	.00	285.16	100.00
*	2375.000	1480.00	151.43	-.79	.74	.00	256.06	100.00
*	2475.000	3000.00	153.03	.00	.81	.00	287.08	100.00
*	2475.000	1480.00	152.23	-.80	.80	.00	284.53	100.00
*	2570.000	3000.00	153.54	.00	.51	.00	279.44	95.00
*	2570.000	1480.00	152.96	-.58	.73	.00	274.07	95.00
*	2667.000	3000.00	154.88	.00	1.34	.00	288.53	97.00
*	2667.000	1480.00	154.25	-.63	1.29	.00	285.65	97.00
	3180.000	3000.00	160.18	.00	5.30	.00	291.82	513.00
	3180.000	1480.00	159.58	-.60	5.33	.00	265.69	513.00
	3494.000	3000.00	163.64	.00	3.46	.00	272.98	314.00
	3494.000	1480.00	162.98	-.66	3.40	.00	269.31	314.00
*	3700.000	3000.00	165.58	.00	1.95	.00	204.00	206.00
	3700.000	1480.00	164.92	-.67	1.94	.00	201.02	206.00
	4335.000	3000.00	172.18	.00	6.60	.00	209.13	635.00
	4335.000	1480.00	171.44	-.74	6.52	.00	206.54	635.00
	4880.000	3000.00	175.72	.00	3.54	.00	62.33	545.00
*	4880.000	1480.00	173.67	-2.05	2.23	.00	37.48	545.00
*	5600.000	3000.00	181.28	.00	5.56	.00	39.07	720.00
*	5600.000	1480.00	178.47	-2.81	4.80	.00	29.55	720.00
	6085.000	2700.00	186.05	.00	4.77	.00	36.87	485.00
	6085.000	1440.00	183.50	-2.54	5.04	.00	31.56	485.00
	6607.000	2700.00	190.07	.00	4.03	.00	40.41	522.00
	6607.000	1440.00	188.02	-2.06	4.51	.00	35.12	522.00

	6885.000	2700.00	193.28	.00	3.21	.00	53.28	278.00
	6885.000	1440.00	191.03	-2.26	3.01	.00	37.79	278.00
*	7041.000	2700.00	196.45	.00	3.17	.00	40.49	156.00
*	7041.000	1440.00	194.21	-2.24	3.19	.00	31.99	156.00

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 321.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 321.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 660.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 660.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 805.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 805.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 885.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 885.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 919.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 919.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
WARNING SECNO= 919.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 920.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 920.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 961.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 961.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1077.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 1106.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1106.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1106.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1106.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1134.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1134.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 1134.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1134.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 1136.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 1136.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1144.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 1144.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 1212.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 1212.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 2189.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2189.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 2189.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2189.000 PROFILE= 2 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 2275.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 2275.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 2375.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 2375.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 2475.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 2475.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 2570.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 2570.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 2667.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 2667.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

```
CAUTION SECNO=    3700.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    3700.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=    4880.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    5600.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    5600.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    5600.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    5600.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    7041.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    7041.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    7041.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    7041.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY
```

THOMSED.DAT

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1*****************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    29MAR00    TIME   09:43:42  *
*****************************************
```

```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS           *
*  HYDROLOGIC ENGINEERING CENTER          *
*  609 SECOND STREET, SUITE D             *
*  DAVIS, CALIFORNIA 95616-4687           *
*           (916) 756-1104                *
*****************************************
```

Post-Project Model with Sediment

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX     XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
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     1
29MAR00       09:43:42                                                    PAGE    1


                                                      THIS RUN EXECUTED 29MAR00    09:43:42

 ************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
 ************************************


T1  THOMPSON CREEK POST-PROJECT RUN 1% FLOW; SCVWD -- SEDIMENT CONDITIONS
T2  RUN FROM AS-BUILT (5/90) STA 6+60 TO 69+25 WITH FIA X-S'S AT START AND END
T3  SWSEL FROM FIA SILVER CK. RUN - THIS VERSION HAS 2' SEDIMENT TO U/S QUIMBY

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

              2.00                                                          132.8

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    1.00              -1.000                                    -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

      150

J5  LPRNT     NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10       -10

J6  IHLEQ     ICOPY     SUBDIV    STRTDS    RMILE

        1


QT        2      2000.      2080
NC     .030       .030       .035        .3         .5
X1    30262          8        950      1060        125        125        125
X3                124.7
GR    132.0        950        130       962      125.0        972      122.7        978      122.7       1035
GR      125       1042        130      1050      131.6       1060

QT        2      3300       2080
NC                           .030        .1         .2
X1    30947          7        959      1038        685        685        685
X3                124.8
GR    132.7        900        132       959      122.8        978      122.8       1023        131       1038
GR      132       1090        134      1100

QT        2      3600       2080
X1    31447          8        955      1042        500        500        500
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```
X3              124.9
GR    134.3       850      133.8       955      122.9       972      122.9      1023       124      1033
GR      132      1042        134      1095        136      1110
        1
   29MAR00      09:43:42                                                                          PAGE    2


QT        2      3000      1480
              STA 2+71 AND STA 3+21 FROM FIA RUN IN WWMM
X1      271         7       958      1048        350       350       350
X3              124
GR    135.      900.    134.      958.      122.      980.      122.      1035.     134.      1048.
GR    136.     1115.    138.     1133.

X1      321         7       960      1041         50        50        50
X3            128.7
GR    135.      900.    134.      960.     126.7      978.     126.7      1021.     134.      1041.
GR    136.     1110.    138.     1130.

              THOMPSON CRK 660 FT U/S OF NORWOOD CREEK -- BEGIN 1991 AS-BUILT RUN
X1    660.       11       970      1172      339.00    339.00    339.00      0.00      0.64      0.00
X3            123.64
GR      137      970     134.5       970       131       982       131      1000       121      1020
GR      121     1080       131      1100       131      1100       131      1120       131      1120
GR      137     1172

NC   0.0500   0.05000   0.05000   0.00000   0.00000
              BEGIN ROCK LINING
X1      805      0.00      0.00      0.00    145.00    145.00    145.00      0.00      0.19      0.00
X3            123.83


X1      855      0.00      0.00      0.00     50.00     50.00     50.00      0.00      0.06      0.00
X3            123.89

NC   0.0130   0.01300   0.01300   0.00000   0.00000
              BEGIN CONCRETE LINING
X1    885.       8       964      1120      30.00     30.00     30.00       .00       .00       .00
X3            123.9
GR    139.5      964     138.5       984     138.4      1000     121.9   1000.01     121.9   1060.01
GR    138.4  1060.02     138.5      1080     141.5      1120         0         0         0         0


X1    886.       8       964      1120       1.00      1.00      1.00       .00       .00       .00
X3            121.4
GR    139.3      964     138.3       984     138.4      1000     119.4   1000.01     119.4   1060.01
GR    138.4  1060.02     138.8      1080     142.8      1120         0         0         0         0


X1    918.      11       980    1080.5      22.00     22.00     22.00       .00       .00       .00
X3            121.9
GR    141.5      960     139.5       964     139.5       980     129.5      1000     119.9   1000.01
GR    119.9  1060.01     129.5   1060.02       139      1080       140      1080.5      140      1096
GR      144     1110         0         0         0         0         0         0         0         0
        1
   29MAR00      09:43:42                                                                          PAGE    3


              DROP STRUCTURE D/S OF QUIMBY
X1    919.       4    1000.00   1060.02      1.00      1.00      1.00       .00       .00       .00
GR    138.5    1000     129.5   1000.01     129.5   1060.01     138.5   1060.02         0         0


X1    920.       4    1000.00   1060.02      1.00      1.00      1.00       .00       .00       .00
X3            128.5
GR    138.5    1000     126.5   1000.01     126.5   1060.01     138.5   1060.02         0         0


X1    928.       4    1000.00   1060.02      8.00      8.00      8.00       .00       .00       .00
X3            128.5
GR    138.5    1000     126.5   1000.01     126.5   1060.01     138.5   1060.02         0         0


X1    946.       4    1000.00   1044.01     18.00     18.00     18.00       .00       .00       .00
X3            128.5
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GR   138.5       1000      126.5    1000.01      126.5    1044.01      138.5    1044.02         0         0

             D/S FACE TRIPLE 12X12 RCB AT QUIMBY
X1    961.         12    1000.00    1038.06      15.00      15.00      15.00       .00       .00       .00
X3              128.5
GR   138.5       1000      126.5    1000.01      126.5    1012.02      138.5    1012.02      138.5    1013.02
GR   126.5    1013.03      126.5    1025.03      138.5    1025.04      138.5    1026.04      126.5    1026.05
GR   126.5    1038.05      138.5    1038.06          0          0          0          0         0         0

             U/S FACE OF QUIMBY CULVERT. BEGIN LEVEE RAISING.
X1    1061       0.00       0.00       0.00     100.00     100.00     100.00       0.00     00.28      0.00
X3              128.78


X1    1077.        12    1000.00    1045.06      16.00      16.00      16.00       .00       .00       .00
X3              129.2
GR   143.8       1000      127.2    1000.01      127.2    1015.51        132    1015.52       132    1016.52
GR   127.2    1016.53      127.2    1028.53        132    1028.54        132    1029.54     127.2    1029.55
GR   127.2    1045.05      143.8    1045.06          0          0          0          0         0         0

X1    1088.        14    1000.00       1098      11.00      11.00      11.00       .00       .00       .00
X3              129.4
GR   142.5        960      142.5        976      142.5       1000      140.9     1003.4     135.4     1008.9
GR   135.3     1025.9      127.4    1025.91      127.4    1070.91      135.3    1070.92     135.3    1087.92
GR   140.8    1093.42        143       1098        143       1154        143       1190         0         0

          (TCL-STA 10+16 OR TCR-STA 10+45)
X1    1105.        17        996       1108      17.00      17.00      17.00       .00       .00       .00
X3      10      129.7
GR     143        957        143        977      143.9        980      143.9        996     142.9      1000
GR   140.9     1003.4      135.4     1008.9      135.4     1025.9      127.7     1025.91     127.7    1070.91
GR   135.4    1070.92      135.4    1087.92      140.9    1093.42      142.9    1096.82       143      1108
GR     143       1136        143       1192          0          0          0          0         0         0
       1
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          (TCL-STA 10+17 OR TCR-STA 10+47)  DROP STRUCTURE U/S OF QUIMBY RD
X1    1106.        12       996.0     1097.6       1.00       1.00       1.00       .00       .00       .00
X3      10
GR     143        952        143        976        144        980        144        996     142.8      1000
GR   140.9     1003.8      135.4     1009.3      135.4     1088.3      140.9     1093.8     143.0    1097.6
GR     143       1104        143       1192          0          0          0          0         0         0

          (TCL-STA 10+45 OR TCR-STA 10+74)
X1    1133.        19        980       1130      27.00      27.00      27.00       .00       .00       .00
X3      10
GR     143        948        143        952        143        956      146.1        965     146.1       980
GR     143        985        143       1001      140.9       1003      135.4     1008.5     135.4    1087.5
GR   140.9       1093      142.5       1096        143       1100        143       1125     146.5      1130
GR   146.5       1141        143       1146        143       1160        143       1192         0         0

          (TCL-STA 10+46 OR TCR-STA 10+76)
X1    1134.        21        987       1137       1.00       1.00       1.00       .00       .00       .00
X3      10
GR     143        951        143        965      146.1        971      146.1        987       143       992
GR   142.5       1000      140.9       1003      136.9     1008.5      136.9       1033     135.9      1048
GR   136.9       1063      136.9     1087.5      140.9       1093      142.5       1096       143      1124
GR     143       1132      146.5       1137      146.5       1148        143       1153       143      1161
GR     143       1196          0          0          0          0          0          0         0         0

          (TCL-STA 10+48 OR TCR-STA 10+79)
X1    1136.        19        986       1140       2.00       2.00       2.00       .00       .00       .00
X3      10
GR     143        956        143        964        144        966      146.1        970     146.1       986
GR     143        992      142.5       1000      140.9       1003      135.4     1008.5     135.4    1087.5
GR   140.9       1093      142.5       1096        143       1099        143       1119       143      1135
GR   146.5       1140      146.5       1155      143.3       1162      143.3       1192         0         0

NC  0.0450    0.04500    0.04500    0.00000    0.00000
          (TCL-STA 10+56 OR TCR-STA 10+86)  START ROCK TRANSITION
X1    1144.        18        986       1138       8.00       8.00       8.00       .00       .00       .00
X3      10.
GR   143.5        938      143.5        965      146.1        970      146.1        986     143.5       992
GR   143.5       1000        141       1005      135.5     1010.5      135.5     1089.5       141      1095
GR   143.5       1100      143.5       1133      146.5       1138      146.5       1139     146.5      1142
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GR    143.5       1148      143.5       1156      143.5       1192         0          0          0          0

          (TCL-STA 11+22 OR TCR-STA 11+65)  END ROCK TRANSITION. BEGIN ROCK SIDES
X1    1212.         23        993        1119       68.00      68.00      68.00        .00        .00        .00
X3      10.
GR      144        826         144        846        144        932        144        940        146        948
GR      146        976       146.4        977      146.4        993        144        999        144       1000
GR    140.5     1010.5       140.5       1016       136.5      1028        136     1054.5      136.5       1088
GR    140.5       1100       140.5     1105.5       141.9      1110      146.7       1119      146.7       1134
GR    144.5       1147       144.5       1158      144.5       1194          0          0          0          0
        1
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          (TCL-STA 13+52 OR TCR-STA 14+20)  BEGIN TRANSITION ROCK SIDES
X1     1462         23        993        1119      250.00     250.00     250.00
X3      10.
GR    146.4        826       146.4        846      146.4        932      146.4        940      147.6        948
GR    147.6        976       148.0        977      148.0        993      146.4        999      146.4       1000
GR    142.9     1010.5       142.9       1016       138.9      1028      138.4     1054.5      138.9       1088
GR    142.9       1100       142.9     1105.5       144.3      1110      147.7       1119      147.7       1134
GR    146.9       1147       146.9       1158      146.9       1194

                                        END TRANSITION ROCK SIDES AND
                                        START LOW FLOW CHANNEL
          (TCL-STA 14+46 OR TCR-STA 15+30)
X1    1565.         20      998.00       1136      103.00     103.00     103.00        .00        .00        .00
X3      10.
GR      145        888         145        912         146        914      147.5        919      147.5        979
GR      149        982         149        998       147.4       1000      142.4     1009.8      142.4     1038.5
GR    139.9     1043.5       139.4     1064.5       139.9      1093.5      142.4     1098.5      142.4     1123.6
GR    147.4     1133.4       148.9       1136      148.9       1152      145.5       1157      145.5       1160

          (TCL-STA 16+42 OR TCR-STA 17+30)
X1     1764         20        998        1136      199.00     199.00     199.00
X3      10.
GR    147.1        888       147.1        912      148.1        914      149.6        919      149.6        979
GR    150.9        982       150.9        998      149.5       1000      144.5     1009.8      144.5     1038.5
GR      142     1043.5       141.5     1064.5         142      1093.5      144.5     1098.5      144.5     1123.6
GR    149.5     1133.4       151.1       1136      151.1       1152      147.6       1157      147.6       1160

          (TCL-STA 18+44 OR TCR-STA 19+30)
X1     1964         20        998        1136      200.00     200.00     200.00
X3      10.
GR    149.1        888       149.1        912      150.1        914      151.6        919      151.6        979
GR    152.9        982       152.9        998      151.5       1000      146.5     1009.5      146.5     1038.5
GR      144     1043.5       143.5     1064.5         144      1093.5      146.5     1098.5      146.5     1123.6
GR    151.5     1133.4       153.3       1136      153.3       1152      149.6       1157      149.6       1160

          (TCL-STA 19+84 OR TCR-STA 20+67)
X1     2104         20        998        1136      140.00     140.00     140.00
X3      10.
GR    150.6        888       150.6        912      151.6        914      153.1        919      153.1        979
GR    154.3        982       154.3        998        153       1000        148     1009.5        148     1038.5
GR    145.5     1043.5         144     1064.5       145.5      1093.5        148     1098.5        148     1123.6
GR      153     1133.5       154.8       1136      154.8       1152      151.1       1157      151.1       1160

          (TCL-STA 20+18 OR TCR-STA 21+17)  END OF LOW FLOW CHANNEL AND
                                            BEGIN ROCK TRANSITION
X1     2164         17       1030        1192         60         60         60          0          0          0
X3      10.
GR      149        964         149        996      150.4       1000      154.7       1008      154.7       1030
GR      148     1042.4         148       1059      145.4       1064      144.3       1080      145.4       1105
GR      148       1110         148     1179.6      155.4       1192      155.4       1208      154.3       1209
GR    149.3       1219       149.3       1223          0          0          0          0          0          0
        1
   29MAR00       09:43:42                                                                              PAGE     6


NC    .0352       .0352       .0352

                                        BEGIN MODIFIED FLOOD PLAIN
                                        END ROCK LINED TRANSITION (CHANGE N)
                                        ROUGHNESS IS 0.06 FOR THE
                                        CHANNEL AND 0.03 FOR THE FLOODPLAIN.
                                        COMPOSITE ROUGHNESS = 0.0352
```

EXPANSION LOSS COEFFICIENT = 0.1

(TCL-STA 20+32 OR TCR-STA 21+38)

X1	2189.	21	900	1090	25.00	25.00	25.00	.00	.00	.00
X3	10.									
GR	148	778	148	870	148.5	873	154.8	885	154.8	900
GR	148.4	920	148	924	148.5	944	150.4	963	149.9	974
GR	149.9	979	147.5	990	144.4	1000	147.3	1005	150	1015
GR	149.5	1024	147.9	1080	155.6	1090	155.6	1106	146.5	1122
GR	147.8	1125	0	0	0	0	0	0	0	0

STATION ADDED 4/90 BY DN FROM SURVEY DATA TO DESCRIBE EXPANSION

X1	2275	13	863	1151	25	25	25			
GR	155.3	850	155.3	863	149.1	876	148.5	912	150.4	983
GR	147	993	145.0	998	145.0	1002	151	1019	149.3	1060
GR	149	1141	155.3	1151	155.3	1175	0	0	0	0

(TCL-STA 22+97 OR TCR-STA 23+67) ADDED 5/87 BY MJK FROM SURVEY DATA

X1	2375.	24	850	1149	100	100	100	.00	.00	.00
X3	10									
GR	149.5	751	149.5	755	149.8	800	150	823	156.1	835
GR	156.1	850	150.3	861	150.4	878	150.3	910	150.5	942
GR	151.5	959.4	152	973.6	152	982.3	149.5	992	146.8	1000
GR	150.3	1010	151.4	1018	151	1037	150.5	1065.8	150	1139
GR	156.3	1149	156.3	1164	150	1172	150	1178	0	0

(TCL-STA 23+95 OR TCR-STA 24+65) BY MJK FROM SURVEY DATA

X1	2475.	24	850	1149	100.00	100.00	100.00	.00	.00	.00
X3	10									
GR	149.5	748	149.5	752	149.8	800	150	823	156.7	835
GR	156.7	850	150.3	861	150.4	878	150.3	910	150.5	942
GR	151.5	959.4	152	973.6	152	982.3	149.5	992	147.8	1000
GR	150.3	1010	151.4	1018	151	1037	150.5	1065.8	150	1139
GR	156.9	1149	156.9	1164	150	1174	150	1175		

(TCL-STA 24+88 OR TCR-STA 25+62) ADDED 5/87 BY MJK FROM SURVEY DATA

X1	2570.	20	860	1160	95.00	95.00	95.00	.00	.00	.00
X3	10.									
GR	151.5	789	151.5	797	151.5	833	157.1	845	157.1	860
GR	151.5	875	151.3	883	152	911	152	947	152.8	968
GR	153	976	152.5	985.8	149.0	1000	152.5	1010	152	1091
GR	152	1145	157.8	1160	157.8	1176	152.4	1185	152.4	1191

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(TCL-STA 25+85 OR TCR-STA 26+56)

X1	2667.	17	865	1170	97.00	97.00	97.00	.00	.00	.00
X3	10	+0.00	+0.00	.00	.00	.00	.00	+0.00	+0.00	
GR	153	799	153	839	158.4	848	158.4	865	153	880
GR	153.5	972	153.5	986	151	1000	150	1006	153	1014
GR	153.5	1046	153	1060	153	1160	158.7	1170	158.7	1187
GR	153	1196	153	1203	0	0	0	0	0	0

(TCL-STA 30+91 OR TCR-STA 31+71)

X1	3180.	19	862	1162	513.00	513.00	513.00	.00	.00	.00
X3	10	+0.00	+0.00					+0.00	+0.00	
GR	158	818	158	838	163.9	846	163.9	862	158	869
GR	159	966	159	985	155.5	990	153.5	1000	156	1005
GR	160	1015	160	1026	159	1056	159	1157	163.8	1162
GR	163.8	1179	158	1187	159	1187	159	1191	0	0

(TCL-STA 33+95 OR TCR-STA 34+83) ADDED 5/87 BY MJK FROM SURVEY DATA

X1	3494.	23	881	1172	314.00	314.00	314.00	.00	.00	.00
X3	10.									
GR	160	844	160	852	167.8	865	167.8	881	166.5	882
GR	161.8	895.4	161.9	916.5	162	937.7	162.5	956.4	162.5	972.9
GR	162.5	979.2	161.9	985	158.4	995.6	155.9	1000	158	1005.9
GR	159.5	1016	162.9	1022	161.4	1157	166.5	1171	167.2	1172
GR	167.2	1188	161	1200	161	1204	0	0	0	0

NC	0.032	0.032	0.032	0.00000	0.00000

CHANGED 5/87 BY MJK FROM SURVEY DATA
(DEEPER CHANNEL N=0.05)
ROUGHNESS IS 0.05 FOR THE CHANNEL
AND 0.025 FOR THE FLOODPLAIN.
COMPOSITE ROUGHNESS = 0.032

```
          (TCL-STA 35+98 OR TCR-STA 37+00)
X1    3700.        19       853      1076     206.00     206.00     206.00       .00       .00       .00
X3       10     +0.00     +0.00                                                 +0.00     +0.00
GR    162.4       813     162.4       824      170.5       837      170.5       853       164       865
GR    164.4       865     164.4       873      164.3       972      163.5       987       158       996
GR    157.9      1004     163.5      1013      164.4      1022        164      1062     167.5      1071
GR    169.6      1076     169.6      1082        166      1094        166      1097         0         0

          (TCL-STA 40+46 OR TCR-STA 42+69)  D/S FUTURE EVERDALE DRIVE &
                                            EXISTING FOOT BRIDGE
                                            CHANGED 5/87 MJK FROM SURVEY DATA.
                                            1% Q CHANGES
X1    4335.        19       797      1016     450.00     550.00     635.00       .00       .00       .00
X3       10     +0.00     +0.00                                                 +0.00     +0.00
GR      169       757       169       769      176.3       781      176.3       797       174       798
GR      171       807       171       923        170       973        169       989       161       997
GR    160.5      1000     160.5      1002        171      1012        173      1013     175.9      1016
GR    175.9      1019       173      1023        169      1039      168.8      1051         0         0
        1
   29MAR00       09:43:42                                                                          PAGE    8


          (TCL-STA 45+13 OR TCR-STA 47+64)  CHANGED 5/87 MJK FROM SURVEY DATA
X1    4880.        19       877      1080     500.00     500.00     545.00       .00       .00       .00
X3       10     +0.00     +0.00                                                 +0.00     +0.00
GR      176       850       176       853      180.5       869      180.5       877     176.5       890
GR    176.5       898     176.5       912        175       957      170.9       965     167.3       983
GR      164       984     163.4       993      168.5       995        176       998     177.3      1053
GR      181      1080       181    1081.5      178.4      1112      178.3      1121         0         0

          (TCL-STA 52+23 OR TCR-STA 53+90)  CHANGED 4/90 DN FROM SURVEY DATA 9/89
X1    5600.        22       850    1063.8     700.00     625.00     720.00       .00       .00       .00
X3       10     +0.00     +0.00                                                 +0.00     +0.00
GR      185       820       185       836      186.9       844      186.9       850     184.8       857
GR    184.5       865       184       876      183.8       926      183.8       954     183.5       976
GR    174.5       993     171.1       995      171.1      1000      175.1      1010     185.1      1025
GR    184.8      1037     184.9      1052      187.5    1063.8      186.7      1067     186.7      1067
GR    186.2    1067.1     186.8      1081          0         0          0         0         0         0

QT        2      2700      1440
                    U/S QUIMBY CREEK.  THE WEST LEVEE FROM HERE TO ABORN ROAD

                    CROSS SECTIONS LOOK DOWNSTREAM
X1    6085.        14       806      1032     350.00     350.00     485.00       .00       .00       .00
X3       10     +0.00     +0.00                                                 +0.00     +0.00
GR    188.5       785     188.5       791        191       795        191       806     188.5       808
GR    188.5       980       179       989      177.5       994        178      1000       178      1010
GR    188.5      1022       191      1032        191      1034        191      1037         0         0

        TCR STA 265+60 P STA 40+40 CHANGED 5/87 MJK FROM SURVEY DATA. END RT LEV
        END POST-PROJECT AS-BULIT SURVEY RUN
X1    6607.        15       898   1011.00     425.00     470.00     522.00       .00       .00       .00
X3       10     +0.00     +0.00                                                 +0.00     +0.00
GR    193.3       878     193.3       886        195       890        195       898     193.3       900
GR    193.3       908       193       936      191.8       964      191.8       964       186       973
GR      183       986       183      1000        194      1011        194      1020     193.5      1031

        X-S FROM FIA RUN; SILVER CK/ THOMPSON CK.
X1    6885.         9       958      1035     278.00     278.00     278.00       .00       .00       .00
GR    196.3       920       196       958        192       980        186       992     185.5      1000
GR    186.0      1008     192.0      1022      196.0      1035        198      1085
        1
   29MAR00       09:43:42                                                                          PAGE    9


IHLEQ = 1.  THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF
PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH.  SEE DOCUMENTATION FOR
DETAILS.
        1
   29MAR00       09:43:42                                                                          PAGE   10


T1  THOMPSON CREEK POST-PROJECT RUN 10% FLOW; SCVWD -- SEDIMENT CONDITIONS
T2  RUN FROM AS-BUILT (5/90) STA 6+60 TO 69+25 WITH FIA X-S'S AT START AND END
T3  SWSEL FROM FIA SILVER CK. RUN  THIS RUN HAS 2 FEET SEDIMENT TO U/S QUIMBY
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		3.00							133.96	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3.00		-1.0000				-1			

IHLEQ = 1. THEREFORE FRICTION LOSS (HL) IS CALCULATED AS A FUNCTION OF PROFILE TYPE, WHICH CAN VARY FROM REACH TO REACH. SEE DOCUMENTATION FOR DETAILS.

THIS RUN EXECUTED 29MAR00 09:43:53

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

L FROM FIA SILVER CK. RU

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	30262.000	.00	.00	.00	124.70	2000.00	132.80	127.59	132.93	4.00	2.84	703.75	999.64
	30262.000	.00	.00	.00	124.70	2080.00	133.96	127.66	134.06	2.55	2.50	831.35	1302.19
	30947.000	685.00	.00	.00	124.80	3300.00	132.97	129.46	133.42	9.91	5.58	671.31	1048.43
	30947.000	685.00	.00	.00	124.80	2080.00	134.11	128.27	134.21	1.99	2.77	896.84	1472.91
	31447.000	500.00	.00	.00	124.90	3600.00	133.43	129.31	133.89	8.90	5.47	679.46	1206.52
	31447.000	500.00	.00	.00	124.90	2080.00	134.20	127.99	134.32	2.10	2.82	798.89	1436.89
	271.000	350.00	.00	.00	124.00	3000.00	133.86	128.09	134.12	4.36	4.04	741.99	1437.08
	271.000	350.00	.00	.00	124.00	1480.00	134.31	126.58	134.37	.89	1.89	786.73	1564.82
*	321.000	50.00	.00	.00	128.70	3000.00	132.97	132.97	134.81	88.30	10.88	275.86	319.25
*	321.000	50.00	.00	.00	128.70	1480.00	134.18	131.44	134.43	8.79	3.99	372.64	499.07
*	660.000	339.00	.00	.00	123.64	3000.00	135.02	127.40	135.12	2.04	2.48	1207.85	2102.54
*	660.000	339.00	.00	.00	123.64	1480.00	134.46	126.03	134.49	.62	1.33	1109.95	1873.25
*	805.000	145.00	.00	.00	123.83	3000.00	135.08	127.59	135.18	5.97	2.53	1184.10	1227.78
*	805.000	145.00	.00	.00	123.83	1480.00	134.48	126.21	134.51	1.87	1.37	1080.31	1083.12
	855.000	50.00	.00	.00	123.89	3000.00	135.11	127.65	135.21	6.07	2.55	1177.13	1217.94
	855.000	50.00	.00	.00	123.89	1480.00	134.49	126.27	134.52	1.91	1.38	1071.19	1070.62
*	885.000	30.00	.00	.00	123.90	3000.00	134.94	128.15	135.26	.97	4.53	662.46	3047.01
*	885.000	30.00	.00	.00	123.90	1480.00	134.45	126.56	134.53	.27	2.34	632.92	2846.77
	886.000	1.00	.00	.00	121.40	3000.00	135.06	125.65	135.27	.52	3.66	819.77	4170.39
	886.000	1.00	.00	.00	121.40	1480.00	134.48	124.06	134.54	.14	1.89	784.91	3913.76
	918.000	22.00	.00	.00	121.90	3000.00	135.08	126.15	135.27	.55	3.51	854.14	4062.75
	918.000	22.00	.00	.00	121.90	1480.00	134.48	124.55	134.54	.16	1.84	805.89	3754.91

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	919.000	1.00	.00	.00	129.50	3000.00	133.75	133.75	135.90	18.34	11.76	255.07	700.46

*	919.000	1.00	.00	.00	129.50	1480.00	134.18	132.16	134.61	3.29	5.27	280.99	816.26
*	920.000	1.00	.00	.00	128.50	3000.00	135.15	132.75	136.03	4.52	7.52	398.92	1410.93
*	920.000	1.00	.00	.00	128.50	1480.00	134.35	131.16	134.63	1.63	4.21	351.16	1157.61
	928.000	8.00	.00	.00	128.50	3000.00	135.15	132.75	136.03	4.50	7.51	399.51	1414.17
	928.000	8.00	.00	.00	128.50	1480.00	134.35	131.15	134.63	1.63	4.21	351.25	1158.08
*	946.000	18.00	.00	.00	128.50	3000.00	133.87	133.73	136.37	15.23	12.68	336.64	768.83
	946.000	18.00	.00	.00	128.50	1480.00	134.14	131.77	134.69	3.19	5.97	248.04	828.62
*	961.000	15.00	.00	.00	128.50	3000.00	134.48	134.48	137.49	34.33	13.92	215.48	512.01
*	961.000	15.00	.00	.00	128.50	1480.00	133.86	132.23	134.77	11.21	7.66	193.12	441.96
	1061.000	100.00	.00	.00	128.78	3000.00	135.32	134.76	137.84	27.15	12.74	235.39	575.71
	1061.000	100.00	.00	.00	128.78	1480.00	133.91	132.51	134.90	12.55	7.99	185.25	417.70
*	1077.000	16.00	.00	.00	129.20	3000.00	136.73	134.47	137.99	7.90	8.99	333.61	1067.05
	1077.000	16.00	.00	.00	129.20	1480.00	134.26	132.54	134.95	6.72	6.64	222.81	571.11
	1088.000	11.00	.00	.00	129.40	3000.00	137.26	135.49	138.04	5.33	7.08	423.44	1299.96
	1088.000	11.00	.00	.00	129.40	1480.00	134.25	132.61	134.96	5.57	6.79	218.12	627.02
	1105.000	17.00	.00	.00	129.70	3000.00	137.21	134.85	138.07	6.24	7.45	402.70	1201.35
	1105.000	17.00	.00	.00	129.70	1480.00	134.15	132.92	135.00	7.25	7.39	200.37	549.61
*	1106.000	1.00	.00	.00	135.40	3000.00	138.89	138.89	140.58	17.41	10.43	287.49	718.91
*	1106.000	1.00	.00	.00	135.40	1480.00	137.58	137.58	138.67	20.13	8.36	177.13	329.91
	1133.000	27.00	.00	.00	135.40	3000.00	139.35	138.89	140.65	11.56	9.17	327.00	882.46
	1133.000	27.00	.00	.00	135.40	1480.00	137.97	137.59	138.74	11.55	7.04	210.32	435.41
*	1134.000	1.00	.00	.00	135.90	3000.00	140.19	140.19	141.85	17.37	10.36	289.48	719.74
*	1134.000	1.00	.00	.00	135.90	1480.00	138.89	138.89	139.97	20.04	8.32	177.91	330.58
*	1136.000	2.00	.00	.00	135.40	3000.00	141.44	138.89	141.97	2.83	5.85	513.03	1782.58
*	1136.000	2.00	.00	.00	135.40	1480.00	139.80	137.59	140.05	1.96	4.04	366.61	1057.70
*	1144.000	8.00	.00	.00	135.50	3000.00	141.44	139.00	141.99	35.58	5.94	505.28	502.98
*	1144.000	8.00	.00	.00	135.50	1480.00	139.80	137.69	140.06	25.13	4.13	358.73	295.24
*	1212.000	68.00	.00	.00	136.00	3000.00	141.60	140.21	142.43	77.42	7.29	411.43	340.96
*	1212.000	68.00	.00	.00	136.00	1480.00	139.91	138.82	140.44	68.76	5.84	253.59	178.48
	1462.000	250.00	.00	.00	138.40	3000.00	143.69	142.60	144.66	98.53	7.90	379.66	302.23
	1462.000	250.00	.00	.00	138.40	1480.00	141.91	141.22	142.59	101.35	6.64	223.00	147.01
	1565.000	103.00	.00	.00	139.40	3000.00	144.87	143.85	145.58	78.19	6.76	443.63	339.27
	1565.000	103.00	.00	.00	139.40	1480.00	143.21	142.83	143.78	129.57	6.08	243.61	130.02

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	1764.000	199.00	.00	.00	141.50	3000.00	146.60	145.95	147.48	109.61	7.52	398.82	286.54
	1764.000	199.00	.00	.00	141.50	1480.00	145.51	144.90	145.99	95.92	5.53	267.41	151.11
	1964.000	200.00	.00	.00	143.50	3000.00	148.74	147.95	149.55	97.39	7.24	414.16	303.99
	1964.000	200.00	.00	.00	143.50	1480.00	147.48	146.90	147.97	101.73	5.63	262.79	146.73
	2104.000	140.00	.00	.00	144.00	3000.00	150.09	149.23	150.87	91.27	7.12	421.62	314.01
	2104.000	140.00	.00	.00	144.00	1480.00	148.84	148.17	149.30	88.89	5.42	273.24	156.98
	2164.000	60.00	.00	.00	144.30	3000.00	150.82	149.39	151.29	50.28	5.52	543.19	423.07
	2164.000	60.00	.00	.00	144.30	1480.00	149.43	148.44	149.72	54.85	4.34	341.05	199.83
*	2189.000	25.00	.00	.00	144.40	3000.00	150.85	150.85	151.89	139.74	8.18	366.87	253.78
*	2189.000	25.00	.00	.00	144.40	1480.00	149.91	149.91	150.67	179.76	7.03	210.67	110.39
*	2275.000	25.00	.00	.00	145.00	3000.00	151.81	150.67	152.08	26.65	4.13	726.54	581.09
*	2275.000	25.00	.00	.00	145.00	1480.00	150.69	149.97	150.88	36.88	3.50	423.27	243.69
*	2375.000	100.00	.00	.00	146.80	3000.00	152.22	151.95	152.80	105.50	6.16	487.10	292.07
*	2375.000	100.00	.00	.00	146.80	1480.00	151.43	151.30	151.88	152.66	5.42	273.21	119.78

*	2475.000	100.00	.00	.00	147.80	3000.00	153.03	152.08	153.31	30.44	4.23	709.09	543.71
*	2475.000	100.00	.00	.00	147.80	1480.00	152.23	151.35	152.37	27.09	3.09	478.62	284.37
*	2570.000	95.00	.00	.00	149.00	3000.00	153.54	153.51	154.31	160.53	7.05	425.49	236.78
*	2570.000	95.00	.00	.00	149.00	1480.00	152.96	152.90	153.44	183.92	5.58	265.20	109.13
*	2667.000	97.00	.00	.00	150.00	3000.00	154.88	154.48	155.38	80.08	5.65	530.90	335.24
*	2667.000	97.00	.00	.00	150.00	1480.00	154.25	153.91	154.53	78.17	4.25	348.46	167.40
	3180.000	513.00	.00	.00	153.50	3000.00	160.18	160.10	160.87	140.99	6.65	451.45	252.65
	3180.000	513.00	.00	.00	153.50	1480.00	159.58	159.48	160.00	144.13	5.24	282.62	123.28
	3494.000	314.00	.00	.00	155.90	3000.00	163.64	163.28	164.16	82.98	5.82	515.05	329.32
	3494.000	314.00	.00	.00	155.90	1480.00	162.98	162.65	163.28	81.33	4.39	337.20	164.11
*	3700.000	206.00	.00	.00	157.90	3000.00	165.58	165.58	166.55	128.45	7.87	381.07	264.70
	3700.000	206.00	.00	.00	157.90	1480.00	164.92	164.86	165.49	134.35	6.05	244.51	127.68
	4335.000	635.00	.00	.00	160.50	3000.00	172.18	171.85	172.88	81.06	6.73	445.50	333.22
	4335.000	635.00	.00	.00	160.50	1480.00	171.44	170.65	171.84	79.26	5.07	291.82	166.24
	4880.000	545.00	.00	.00	163.40	3000.00	175.72	173.92	177.30	74.88	10.10	296.99	346.69
*	4880.000	545.00	.00	.00	163.40	1480.00	173.67	171.36	174.45	32.97	7.10	208.42	257.76
*	5600.000	720.00	.00	.00	171.10	3000.00	181.28	181.28	184.12	102.44	13.54	221.60	296.40
*	5600.000	720.00	.00	.00	171.10	1480.00	178.47	178.47	180.64	114.97	11.82	125.26	138.03
	6085.000	485.00	.00	.00	177.50	2700.00	186.05	185.18	188.19	68.96	11.76	229.69	325.13
	6085.000	485.00	.00	.00	177.50	1440.00	183.50	182.92	185.08	74.60	10.09	142.77	166.72

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
6607.000	522.00	.00	.00	183.00	2700.00	190.07	190.06	192.65	98.58	12.88	209.59	271.93
6607.000	522.00	.00	.00	183.00	1440.00	188.02	187.98	189.88	107.04	10.96	131.38	139.18
6885.000	278.00	.00	.00	185.50	2700.00	193.28	193.01	195.26	85.55	11.28	239.40	291.92
6885.000	278.00	.00	.00	185.50	1440.00	191.03	190.86	192.69	94.17	10.34	139.22	148.39

L FROM FIA SILVER CK. RU

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
30262.000	2000.00	132.80	.00	.00	.00	110.00	.00
30262.000	2080.00	133.96	1.16	.00	.00	110.00	.00
30947.000	3300.00	132.97	.00	.17	.00	194.83	685.00
30947.000	2080.00	134.11	1.14	.15	.00	200.00	685.00
31447.000	3600.00	133.43	.00	.47	.00	124.38	500.00
31447.000	2080.00	134.20	.77	.09	.00	224.89	500.00
271.000	3000.00	133.86	.00	.43	.00	89.60	350.00
271.000	1480.00	134.31	.45	.12	.00	118.57	350.00
* 321.000	3000.00	132.97	.00	-.89	.00	75.66	50.00
* 321.000	1480.00	134.18	1.21	-.13	.00	98.34	50.00
* 660.000	3000.00	135.02	.00	3.05	.00	178.90	339.00
* 660.000	1480.00	134.46	-.56	.28	.00	172.16	339.00
* 805.000	3000.00	135.08	.00	.05	.00	177.29	145.00
* 805.000	1480.00	134.48	-.60	.02	.00	170.06	145.00
855.000	3000.00	135.11	.00	.03	.00	176.81	50.00
855.000	1480.00	134.49	-.62	.01	.00	169.41	50.00

*	885.000	3000.00	134.94	.00	-.17	.00	60.02	30.00
*	885.000	1480.00	134.45	-.49	-.04	.00	60.02	30.00
	886.000	3000.00	135.06	.00	.12	.00	60.02	1.00
	886.000	1480.00	134.48	-.58	.03	.00	60.02	1.00
	918.000	3000.00	135.08	.00	.02	.00	82.88	22.00
	918.000	1480.00	134.48	-.60	.00	.00	80.45	22.00
*	919.000	3000.00	133.75	.00	-1.33	.00	60.01	1.00
*	919.000	1480.00	134.18	.43	-.30	.00	60.01	1.00
*	920.000	3000.00	135.15	.00	1.40	.00	60.01	1.00
*	920.000	1480.00	134.35	-.80	.17	.00	60.01	1.00
	928.000	3000.00	135.15	.00	.01	.00	60.01	8.00
	928.000	1480.00	134.35	-.80	.00	.00	60.01	8.00
*	946.000	3000.00	133.87	.00	-1.28	.00	44.01	18.00
	946.000	1480.00	134.14	.26	-.22	.00	44.01	18.00
*	961.000	3000.00	134.48	.00	.61	.00	36.04	15.00
*	961.000	1480.00	133.86	-.62	-.28	.00	36.04	15.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
1061.000	3000.00	135.32	.00	.84	.00	36.05	100.00
1061.000	1480.00	133.91	-1.41	.06	.00	36.04	100.00
* 1077.000	3000.00	136.73	.00	1.41	.00	45.05	16.00
1077.000	1480.00	134.26	-2.47	.35	.00	45.05	16.00
1088.000	3000.00	137.26	.00	.53	.00	82.84	11.00
1088.000	1480.00	134.25	-3.02	-.02	.00	45.02	11.00
1105.000	3000.00	137.21	.00	-.06	.00	82.64	17.00
1105.000	1480.00	134.15	-3.06	-.09	.00	45.02	17.00
* 1106.000	3000.00	138.89	.00	1.68	.00	85.97	1.00
* 1106.000	1480.00	137.58	-1.30	3.43	.00	83.36	1.00
1133.000	3000.00	139.35	.00	.46	.00	86.89	27.00
1133.000	1480.00	137.97	-1.38	.39	.00	84.16	27.00
* 1134.000	3000.00	140.19	.00	.84	.00	88.04	1.00
* 1134.000	1480.00	138.89	-1.29	.92	.00	84.48	1.00
* 1136.000	3000.00	141.44	.00	1.25	.00	91.99	2.00
* 1136.000	1480.00	139.80	-1.64	.90	.00	87.79	2.00
* 1144.000	3000.00	141.44	.00	.00	.00	91.78	8.00
* 1144.000	1480.00	139.80	-1.64	.00	.00	87.61	8.00
* 1212.000	3000.00	141.60	.00	.16	.00	101.85	68.00
* 1212.000	1480.00	139.91	-1.69	.11	.00	80.39	68.00
1462.000	3000.00	143.69	.00	2.08	.00	99.89	250.00
1462.000	1480.00	141.91	-1.78	2.00	.00	78.08	250.00
1565.000	3000.00	144.87	.00	1.18	.00	123.50	103.00
1565.000	1480.00	143.21	-1.66	1.30	.00	116.98	103.00
1764.000	3000.00	146.60	.00	1.73	.00	122.07	199.00
1764.000	1480.00	145.51	-1.09	2.30	.00	117.77	199.00
1964.000	3000.00	148.74	.00	2.13	.00	122.71	200.00
1964.000	1480.00	147.48	-1.26	1.96	.00	117.85	200.00
2104.000	3000.00	150.09	.00	1.35	.00	122.20	140.00
2104.000	1480.00	148.84	-1.24	1.37	.00	117.39	140.00
2164.000	3000.00	150.82	.00	.73	.00	147.15	60.00
2164.000	1480.00	149.43	-1.39	.59	.00	142.22	60.00

*	2189.000	3000.00	150.85	.00	.03	.00	171.49	25.00
*	2189.000	1480.00	149.91	-.95	.47	.00	149.44	25.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	2275.000	3000.00	151.81	.00	.96	.00	275.16	25.00
*	2275.000	1480.00	150.69	-1.12	.79	.00	262.92	25.00
*	2375.000	3000.00	152.22	.00	.40	.00	285.16	100.00
*	2375.000	1480.00	151.43	-.79	.74	.00	256.06	100.00
*	2475.000	3000.00	153.03	.00	.81	.00	287.08	100.00
*	2475.000	1480.00	152.23	-.80	.80	.00	284.53	100.00
*	2570.000	3000.00	153.54	.00	.51	.00	279.44	95.00
*	2570.000	1480.00	152.96	-.58	.73	.00	274.07	95.00
*	2667.000	3000.00	154.88	.00	1.34	.00	288.53	97.00
*	2667.000	1480.00	154.25	-.63	1.29	.00	285.65	97.00
	3180.000	3000.00	160.18	.00	5.30	.00	291.82	513.00
	3180.000	1480.00	159.58	-.60	5.33	.00	265.69	513.00
	3494.000	3000.00	163.64	.00	3.46	.00	272.98	314.00
	3494.000	1480.00	162.98	-.66	3.40	.00	269.31	314.00
*	3700.000	3000.00	165.58	.00	1.95	.00	204.00	206.00
	3700.000	1480.00	164.92	-.67	1.94	.00	201.02	206.00
	4335.000	3000.00	172.18	.00	6.60	.00	209.13	635.00
	4335.000	1480.00	171.44	-.74	6.52	.00	206.54	635.00
	4880.000	3000.00	175.72	.00	3.54	.00	62.33	545.00
*	4880.000	1480.00	173.67	-2.05	2.23	.00	37.48	545.00
*	5600.000	3000.00	181.28	.00	5.56	.00	39.07	720.00
*	5600.000	1480.00	178.47	-2.81	4.80	.00	29.55	720.00
	6085.000	2700.00	186.05	.00	4.77	.00	36.87	485.00
	6085.000	1440.00	183.50	-2.54	5.04	.00	31.56	485.00
	6607.000	2700.00	190.07	.00	4.03	.00	40.41	522.00
	6607.000	1440.00	188.02	-2.06	4.51	.00	35.12	522.00
	6885.000	2700.00	193.28	.00	3.21	.00	53.28	278.00
	6885.000	1440.00	191.03	-2.26	3.01	.00	37.79	278.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 321.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 321.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
WARNING SECNO= 321.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 660.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 660.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 805.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 805.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 885.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 885.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 919.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 919.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
WARNING SECNO= 919.000 PROFILE= 2 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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WARNING SECNO=     920.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     920.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     946.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     961.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     961.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
WARNING SECNO=     961.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    1077.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    1106.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1106.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    1106.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1106.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    1134.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1134.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    1134.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1134.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY

WARNING SECNO=    1136.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    1136.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    1144.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    1144.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    1212.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    1212.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    2189.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    2189.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    2189.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    2189.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY
      1
  29MAR00      09:43:42                                                    PAGE   19


WARNING SECNO=    2275.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    2275.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    2375.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    2375.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    2475.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    2475.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    2570.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    2570.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    2667.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=    2667.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    3700.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    3700.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=    4880.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    5600.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    5600.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    5600.000  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    5600.000  PROFILE=  2  MINIMUM SPECIFIC ENERGY
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Attachment O

Engineering Analysis for Floodwall at Station TCR 42+65 to 43+93.12

4. ENCROACHMENT INFORMATION

1. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP? ☐ Yes ☐ No

, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

2. Does the development in the floodway cause the 1% annual chance (base) elevation to increase at any location by more than 0.000 feet? ☐ Yes ☐ No ☐ N/A

3. Does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the base flood elevation to increase at any location by more than one foot (or other increase limit if community or state has adopted more stringent criteria - even if a floodway has not been delineated by FEMA)? ☐ Yes ☐ No

If the answer to either items is Yes, please attach documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

5. MAINTENANCE RESPONSIBILITY

The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____ flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

(Name)

Operation and maintenance plans are attached. ☐ **Yes** ☐ **No** ☐ **N/A**

6. REVIEW FEE

The review fee for the appropriate request category has been included. ☐ Yes Fee amount: $_____

OR

This request is based on a federally sponsored flood-control project where 50 percent or more of the project's cost is federally sponsored, or the request is based on detailed hydrologic and hydraulic studies conducted by Federal, State, or local agencies to replace approximate studies conducted by FEMA and shown on the effective FIRM; thus the project is fee exempt. ☐ Yes

Please see Instructions for Fee Amounts FOR STRUCTURAL ANALYSIS OF FLOODWALL

7. SIGNATURE

Note: I understand that my signature indicates that all information submitted in support of this request is correct

_____
Signature of Revision Requester

_____
Printed Name and Title of Revision Requester

_____
Company Name

_____
Telephone No. Date

Note: Signature indicates that the community understands, from the revision requester, the impacts of the revision on flooding conditions in the community.

_____
Signature of Community Official

_____
Printed Name and Title of Community Official

_____
Community Name

_____
Telephone No. Date

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR.

This certification is in accordance with 44 CFR Ch. 1, Sec. 65.2

Stephen M. Ferrant
Signature

47275
EXP. 12-31-03

Printed Name and Title of Revision Requester

Lic. No. C47275 Expires (Date) 12/31/03 State CA

Type of License/Expertise: CIVIL ENGINEER

Check which forms have been included with this request

Form Name and (Number)	Required if .....
☐ Hydrologic (3)	new or revised discharges
☐ Hydraulic (4)	new or revised water-surface elevations
☐ Mapping (5)	floodplain/floodway changes
☐ Channelization (6)	channel is modified
☐ Bridge/Culvert (7)	addition/revision of bridge/culvert
☐ Levee/Floodwall (8)	addition/revision of levee/floodwall
☐ Coastal (9)	new or revised coastal elevations
☐ Coastal Structures (10)	addition/revision of coastal structure
☐ Dam (11)	addition/revision of dam
☐ Alluvial Fan (12)	structures proposed on alluvial fan

FLOODWALL @ [illegible]

Floodwall and Foundation Stability

1. Design analysis submittal is based on Code:

   ☐ UBC (1988) or ☐ Other (specify) ACI

2. Stability analysis submitted provides for:

   ☒ Overturning; ☒ Sliding; If not, explain _____

3. Loading included in the analyses were: (Equivalent Active Pressure

   ☒ Lateral earth @ P_A = 40 psf; P_p = 300 psf
   ☐ Surcharge – Slope @ N/A, ☐ surface N/A psf
   ☐ Wind @ P_w = N/A psf
   ☐ Seepage (Uplift); ☐ Earthquake @ P_{eq} = N/A %g
   ☐ 100-year significant wave height N/A ft.
   ☐ 100-year significant wave period N/A sec.

4. Summary of Stability Analysis Results: Factors of Safety. Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		TCR-STA. 42+65 to TCR-STA. 43+93.12		Sta ____	To ____
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5	---	---		
Dead & Soil	1.5	1.5	---	---		
Dead, Soil, Flood & Impact	1.5	1.5	2.84	1.53		
Dead, Soil & Seismic	1.3	1.3	---	---		

(Ref: FEMA 114 Sept 1986; COE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

5. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load	Short Term Load
Computed design maximum	1198 psf	N/A psf
Maximum allowable	2000 psf	N/A psf

6. Foundation scour protection ☐ is, ☒ is not provided, (describe)

Note: Attach engineering analysis to support construction plans.

REGISTERED PROFESSIONAL ENGINEER STEPHEN M. FERRANTI 47275 EXP. 12-31-03 CIVIL STATE OF CALIFORNIA

Scope No. 404736

By S. M. FERRANTI

Date MAY 7, 1990

Checked by SJ Date 7-24-90

Santa Clara Valley Water District
5750 Almaden Expressway, San Jose 95118, Phone 265-2600

Subject THOMPSON CREEK - FLOODWALL

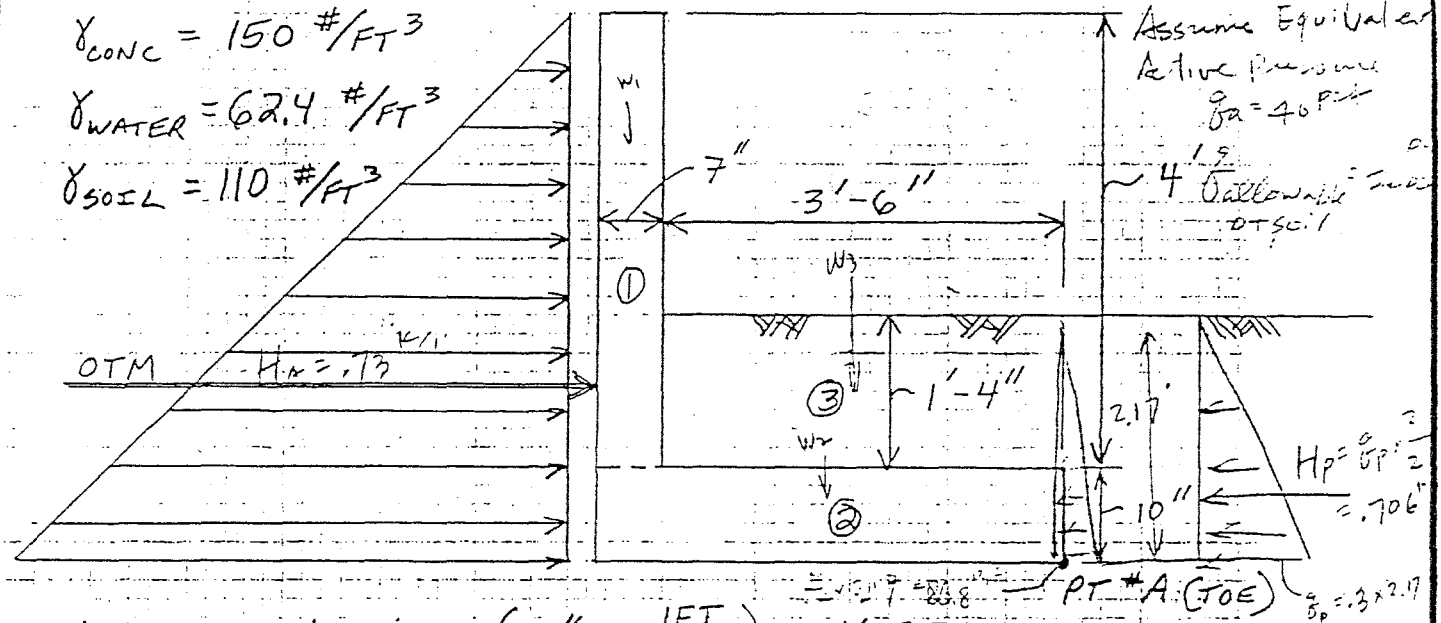
FLOODWALL ANALYSIS: CASE II

GIVEN: 1'-4" (MIN) OF SOIL PLACED ABOVE TOP OF FOOTING

$\gamma_{CONC} = 150\ \#/FT^3$

$\gamma_{WATER} = 62.4\ \#/FT^3$

$\gamma_{SOIL} = 110\ \#/FT^3$



$h_{LOAD} = 4\ FT + (10" \times \frac{1FT}{12"}) = 4.83\ FT.$

$A_1 = (7" \times \frac{1FT}{12"})(4\ FT) = 2.3\ FT^2$ $W_1 = 2.3 \times .15 = .345$ K/F

$A_2 = (10" \times \frac{1FT}{12"})(49" \times \frac{1FT}{12"}) = 3.4\ FT^2$ $W_2 = 3.4 \times .15 = .51$ K/F

$X_1 = 3.5\ FT. + (7")(\frac{1}{2})(\frac{1FT}{12"}) = 3.79\ FT$

$X_2 = (3.5\ FT. + (7" \times \frac{1FT}{12"}))(\frac{1}{2}) = 2.04\ FT$

$A_3 = (1.33\ FT)(3.5\ FT) = 4.6\ FT^2$ $W_3 = 4.6 \times .11 = .512$ K/FT

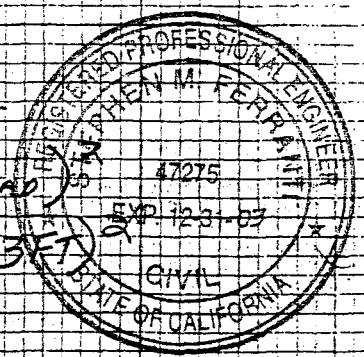
$X_3 = 3.5\ FT\ (\frac{1}{2}) = 1.75\ FT$

FIND OVERTURNING MOMENT (OTM):

$$OTM = \frac{h_{LOAD}}{3} \times \frac{1}{2}(\gamma_{WATER})(h_{LOAD})^2$$

$$OTM = \frac{4.83FT}{3} \times \frac{1}{2}(62.4\ \frac{1b}{1FT^3})(4.83FT)^2$$

$OTM = 1,174.3\ FT\text{-}1b$



Santa Clara Valley Water District
5750 Almaden Expressway, San Jose 95118, Phone 265-2600

Scope No. 40473B
By S.M. FERRANTI
Date MAY 8, 1990
Subject THOMPSON CREEK - FLOODWALL
Checked by [illegible] Date 7-24-90

FIND RESISTING MOMENT / STAB MOMENT:

$\circlearrowleft + M_A = A_1 \gamma_{CONC} X_1 + A_2 \gamma_{CONC} X_2 + A_3 \gamma_{SOIL} X_3 + \frac{1}{2}\gamma_a \times 2.17 \times \frac{2.17}{2} \times \frac{2.17}{3}$ (=40 psf)

$\circlearrowleft + M_A = (2.33\ FT^2)(150\#/FT^3)(3.79\ FT) + (3.4\ FT^2)(150\#/FT^3)(2.04\ FT) + (4.66\ FT^2)(110\#/FT^3)(1.75\ FT) + 68.1$

$\circlearrowleft + M_A = 1,324.6\ FT\text{-}lb + 1,040.4\ FT\text{-}lb + 898.3\ FT\text{-}lb + 68.1$

$\circlearrowleft + M_{RA} = 3,331\ FT\text{-}lb$ (~~3,263.3~~)

$\Sigma W = W_1 + W_2 + W_3$
$= .345^K + .51^K + .512^K$
$= 1.367^K$

$e = \frac{M_{-1}}{\Sigma W} = \frac{1.174^{K\text{-}ft}}{1.367^K} = 0.859'$

$L/6 = \frac{(3.5+.5)}{6} = .67$

$< e$

Soil Pressure $= P = \frac{2(\Sigma W)}{3(\frac{L}{2} - e)b} = \frac{2 \times 1.367}{3(\frac{4'}{2} - .859) \times 1'} = 1.192\ KSF = 1192\ PSF$

$< P_{allow}$

CHECK OVERTURNING:

$\frac{M_{RA}}{OTM} > 2.0$ THEN OK!

$\frac{3,263.3\ FT\text{-}lb}{1,174.3\ FT\text{-}lb} > 2.0$ THEN OK

2.8 ~~2.78~~ > 2.0 OK!

FOOTING SOIL PRESSURE:



$R_V = (7'' \times \frac{1FT}{12''})(4FT)(150\#/FT^3) + (10'' \times \frac{1FT}{12''})(49'' \times \frac{1FT}{12''})(150\#/FT^3) + (1.3\ FT)(3.5\ FT)(110\#/FT^3)$

$R_V = 350.0\#/FT + 510.4\#/FT + 513.3\#/FT$

$R_V = 1,373.7\#/FT$

REGISTERED PROFESSIONAL ENGINEER
STEPHEN M. FERRANTI
47275
EXP 12-31-93
CIVIL
STATE OF CALIFORNIA

SAFETY FACTOR AGAINST SLIDING:

ASSUME: NO EROSION OCCURS ON SOIL 1'-4" ABOVE FOOTING, THUS PASSIVE PRESSURE WILL INCLUDE THIS DEPTH.

Scope No. 40473B

By S.M. FERRANTI

Date MAY 8, 1990

Checked by EJ Date 7-24-90

Santa Clara Valley Water District

5750 Almaden Expressway, San Jose 95118, Phone 265-2600

Subject THOMPSON CREEK - FLOODWALL

$$H_p = \frac{\gamma_{(PASSIVE\ SOIL)}\ (h_{FOOTING} + h_{SOIL})^2}{2}$$

USE $\gamma_{(PASSIVE)} = 300\ \#/FT^3$ (SEE PAGE #3)

$$H_p = \frac{300\ \#/FT^3\ \left(\frac{10''}{12''/FT} + 1.33\ FT\right)^2}{2}$$

$H_p = 704.2\ \#/FT$

$H_A = \gamma_{WATER}\ (h_{LOAD})^2$

$H_A = 62.4\ lb/FT^3\ (4.83\ FT)^2$

$H_A = 727.9\ \#/FT$

$H_A = .73^{K/1}$

$\Sigma W = W_1 + W_2 + W_3$

$= .345 + .51 + .512$

$= (1.367)^{K/1}\ 1.3 = 0.410$

Assume Allowable passive pressure from backfill soil is 300 pcf

$H_p = .300^{KCF} \times (2.17')^2/2 = 0.706^{K/1}$

CHECK FOR SLIDING: Total Lateral resistance = $H_p + \Sigma W$ = 1.12

$$SLIDING = \frac{f_{(SLIDING)}\ R_V + H_p}{H_A} > 1.5 \text{ THEN OK}$$

ASSUME $f_{(SLIDING)} = 0.30$

$\frac{H_p + \Sigma W}{H_A} = \frac{1.12}{.73} = 1.53 > 1.5$ O/K

$$SLIDING = \frac{0.30\ (1,373.7\ \#/FT) + 704.2\ \#/FT}{727.9\ \#/FT} > 1.5$$

$1.53 > 1.5$ OK!

NO SHEAR KEY IS REQUIRED

REGISTERED PROFESSIONAL ENGINEER STEPHEN M. FERRANTI 47275 EXP 12-31-03 CIVIL STATE OF CALIFORNIA

CONCLUSION:

NO SHEAR KEY IS REQUIRED FOR FLOODWALL IF A MINIMUM OF 1'-4" OF SOIL IS PLACED ON THE FLOODWALL FOOTING. THIS ASSUMES NO EROSION, AND SOIL HEIGHT REMAINS CONSTANT SEVERAL FEET FROM FLOODWALL.

Attachment P

Santa Clara Valley Water District Act

- Not included for in-house copy.

See WebPage at

www.scvwd.dst.ca.us

District Act is printable from this website